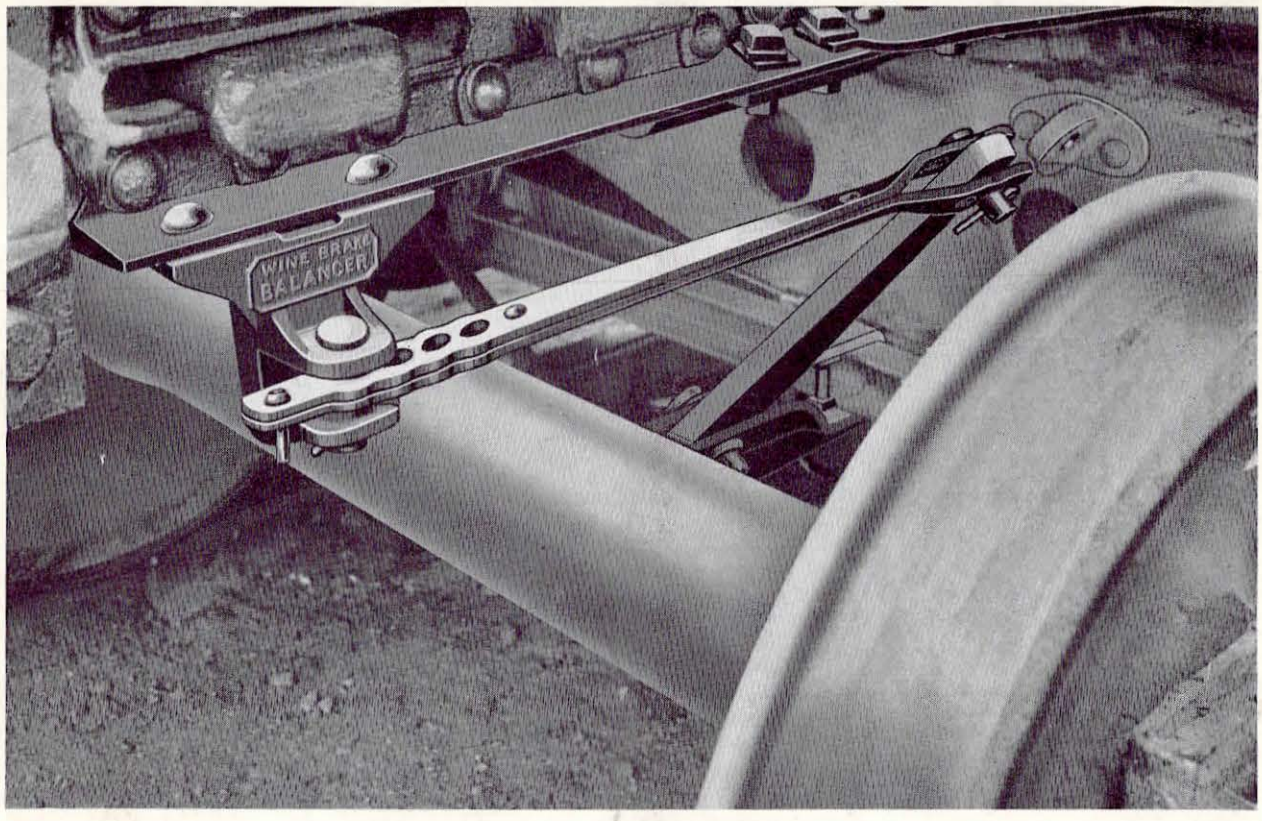
DECEMBER 12, 1936

Railway Age

Founded in 1856

McCARTNEY LIBRARY
GENEVA COLLEGE

REDUCE TRUCK MAINTENANCE



EQUALIZE BRAKE FORCES

WITH

THE WINE BRAKE BALANCER

THE WINE RAILWAY APPLIANCE CO. TOLEDO, OHIO.

Built by Edw. G. Budd Mfg. Co.

OKONITE

The dependability of Okonite has contributed to the safe operation and adherence to schedules of many railroads. The Chicago Burlington and Quincy Railroad has wired the cars of their Zephyrs with Okonite Car Wire because of its dependability. Okonite insulation is dependable, but it also renders a long and useful life.

THE OKONITE COMPANY

Founded 1878

HAZARD INSULATED WIRE WORKS DIVISION

THE OKONITE-CALLENDER CABLE COMPANY, INC.

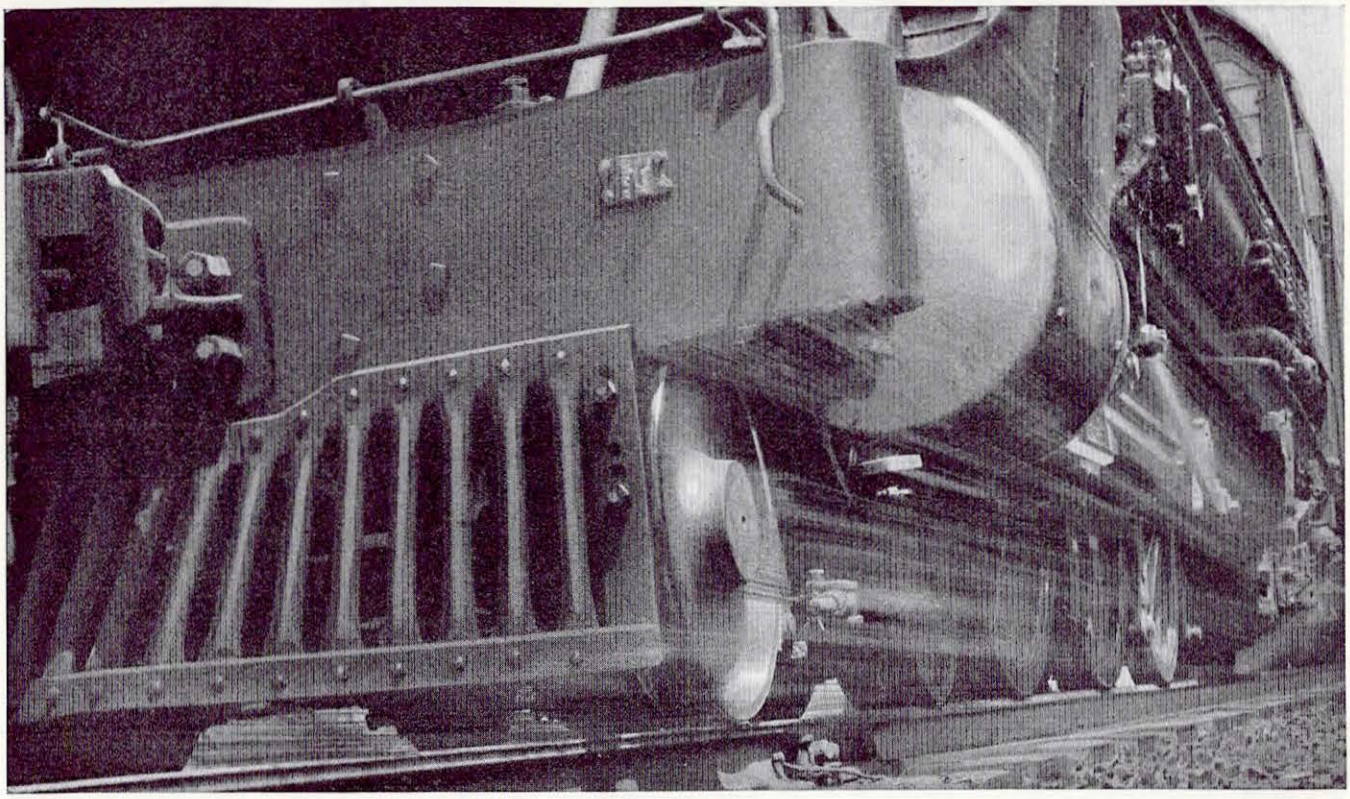
EXECUTIVE OFFICE: PASSAIC, N. J.

New York Boston Seattle Buffalo Chicago Dallas Detroit Atlanta
Philadelphia Los Angeles Pittsburgh Washington San Francisco

Factories: Passaic, N. J. Wilkes-Barre, Pa. Paterson, N. J.

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

MAYARI ENGINE-BOLT STEEL is the Answer



When higher speeds show up in Motive-Power Maintenance

IF a sudden rise in locomotive maintenance occurs as faster schedules go into effect, it indicates that some parts are not strong enough for today's increased strains. More than likely the engine bolts made of carbon steel can't stay tight under the weaving that results from the rack of higher speeds.

The substitution of bolts of Mayari Engine-Bolt Steel will do a great deal toward bringing maintenance back down to reasonable figures. The greater strength of these bolts is sufficient to more than offset increased stresses; and with bolts tight, wear and tear on the entire locomotive will go down.

Give Mayari Engine-Bolt Steel a tryout—it costs little more than carbon steel and it requires no heat-treating. Better yet, use alloy steels in all vital parts on locomotives for one or two of your toughest runs. There is no question about their holding up—too many roads are already using alloys to have any doubt there. Find out for yourself how much maintenance can be cut with modern alloy steels. Bethlehem engineers will be glad to help you work out specifications for various parts—their wide experience with these steels in railroad service will be a valuable aid.

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

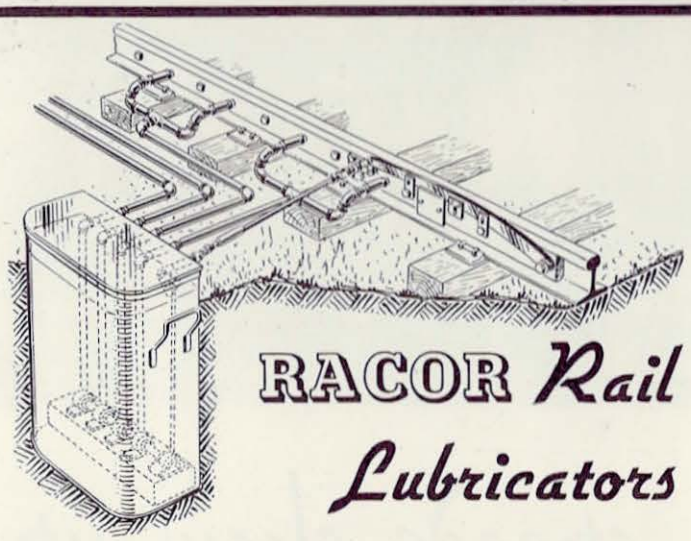
RAMAPO AJAX
CORPORATION

CANADIAN RAMAPO IRON WORKS, LIMITED

General Offices: 230 Park Avenue, N. Y.

Racor Works: Hillburn, New York; Niagara Falls, N. Y.; Chicago, Ill.; East St. Louis, Ill.; Superior, Wis.; Pueblo, Col.; Los Angeles, Cal.; Seattle, Wash.; Niagara Falls, Ont.

RACOR

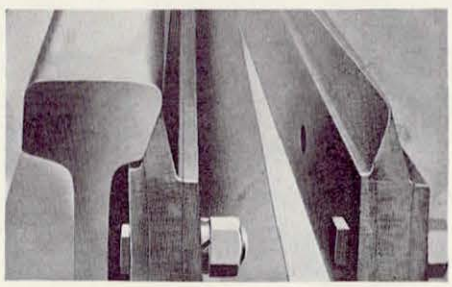


RACOR *Rail Lubricators*

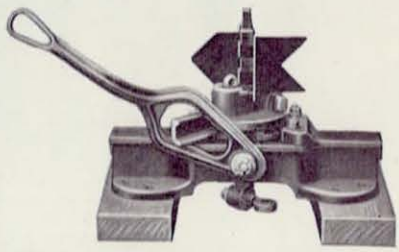
coat entire circumference of the flanges of thirty-three inch wheels with an evenly distributed film of grease. This insures a maximum delivery of lubricant on curves and minimum wastage on tangents and adjacent to the lubricator.

RACOR

Samson Switch Points



do away with broken down switch points and the need for switch point protectors. Samson Points wear smoothly, and give a much longer life. They cost but little more and give added safety.



RACOR 20-B *Automatic Switch Stands*

The average life of an automatic stand is more than double that of a rigid stand.

The 20-B, with its newly designed lever provided with an apron to protect its working parts from the entrance of dust and snow is safer and surer in operation. This protection adds still more to the life of the stand.

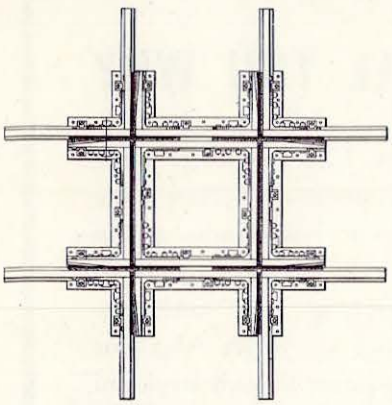
Automatic stands are replaced only when worn out. They are not broken or damaged by runaway cars.

TRACK SPECIALTIES

designed for higher speed, easier riding, greater safety lower maintenance costs, and elimination of lost time.

For nearly 60 years, the Racor organization has been anticipating railroad requirements by maintaining a close contact with railroad officials. Racor engineers divide their time between tracks and switch yards and the drafting rooms. These products meet the demands of modern transportation. Slightly higher initial costs are offset by reduced maintenance and longer life. Our factories and offices all over the country are at your service. Call on us with your problems.

RACOR

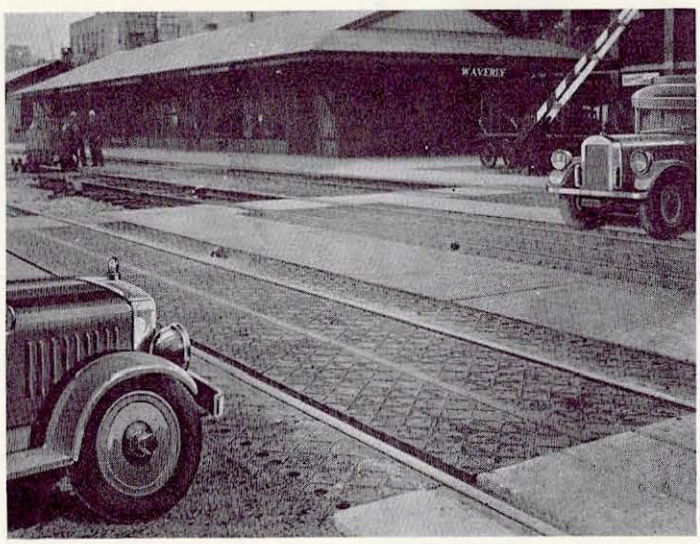


RACOR *Heat Treated Rail Crossings*

give more than double the life of standard crossings, and are freer from breakage with less maintenance expense.

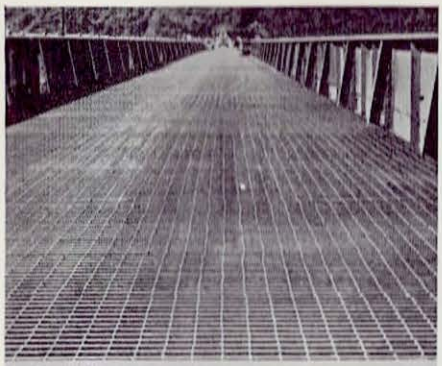
RACOR *Vertical Compensating Rods*

give long life with low maintenance costs, insure rigidity and give effective hold-downs for switch points.

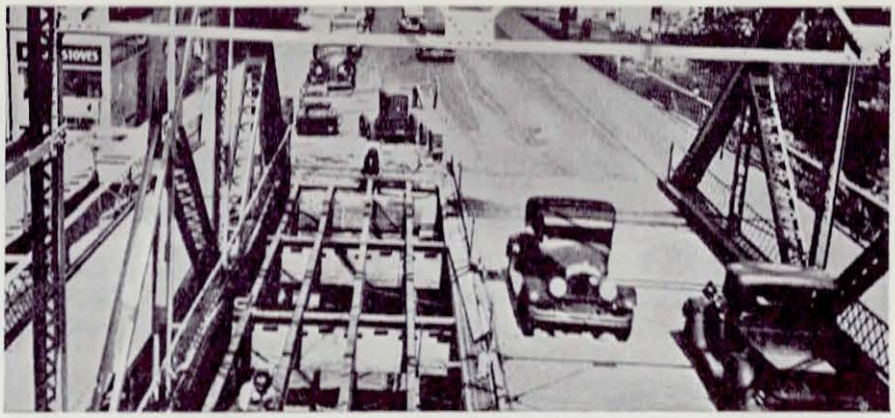


RACOR *Highway Crossings*

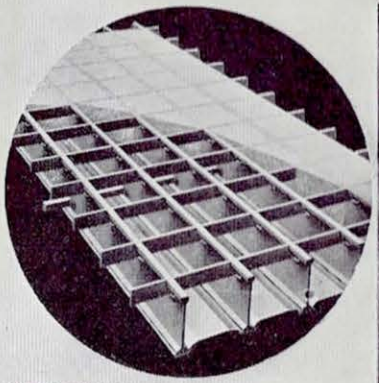
tend to prevent accidents and foster public good will. They give an even, non-skid surface that may be removed for track maintenance and then replaced while ordinary Macadam crossings must be completely destroyed and a new surface laid. Heavy traffic, frost or rain cannot harm Racor Crossings. Hundreds are installed throughout the country at busy main highways and in the yards of industrial plants. The first cost is the last cost.



GOES DOWN FAST to stay down in service. On the Market Street Bridge at Harrisburg, Pa., 1400 lineal feet of I-Beam-Lok roadway, 18'-8" wide, were installed by 2 crews in 2 working days of two 7-hour shifts each day. And this is no isolated example. In practically every installation USS I-Beam-Lok makes possible faster installation — a quicker return on your bridge investment.



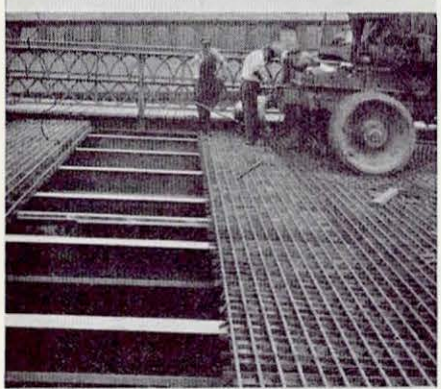
MINIMUM INTERRUPTION TO TRAFFIC: With USS I-Beam-Lok you can quickly repair or resurface bridge floors without once putting out the detour sign. Ask toll-bridge owners. They'll tell you that USS I-Beam-Lok keeps bridges open, keeps revenue coming in right through construction.



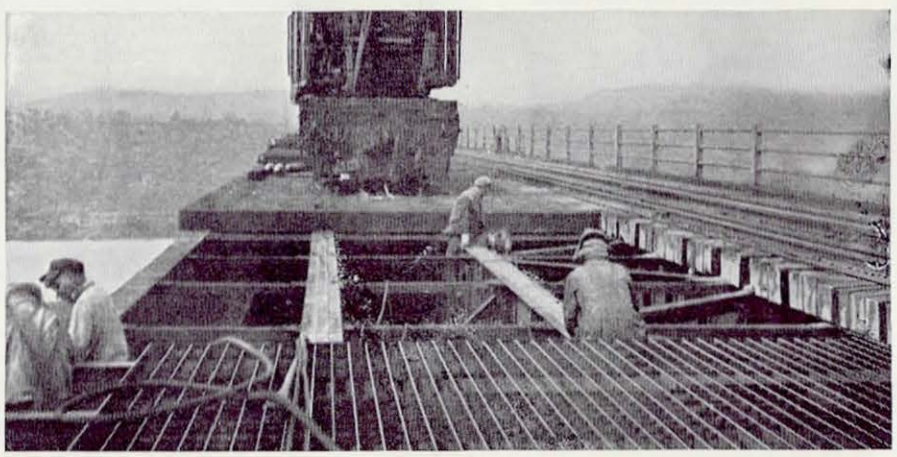
NEW SECTION: This drawing shows significant details of the new 4¼" USS I-Beam-Lok section. Spacing of both the I-Beams and the cross bars has been increased to 6" centers. The result? Lower purchase price and installation costs, increased depth and rigidity. Number of field welds cut by ⅓.

THESE PICTURES TELL YOU WHY

Starting from scratch two years ago, USS I-Beam-Lok has won an enviable place in bridge construction. Now more than 900,000 square feet, more than 7,500 tons, are in service on bridges the country over — enough to floor or refloor a bridge nearly eight miles long. Just take time to look at the five photographs and you'll see why this product, combining the superior qualities of both steel and concrete, merits such whole-hearted acceptance.



CUTS REHANDLING COSTS: Notice how heavy equipment can be run on the unfilled units as soon as they are in place. Thus, concrete can be delivered to the job in two or three yard transit mixers and discharged at exact location where required. No temporary runways or planking needed. No costly rehandling of materials by workmen.



VERSATILE: Today USS I-Beam-Lok is being successfully applied not only to highway bridges, but to railroad bridges and grade crossings as well. Because it increases live-load capacity without sacrificing flooring strength, because it makes possible a surface of alternate steel and concrete that is long-lived, highly resistant to wear, fire-proof, anti-skid, and free from progressive cracking—USS I-Beam-Lok is ideally suited to any bridge flooring job.

U·S·S I-BEAM-LOK

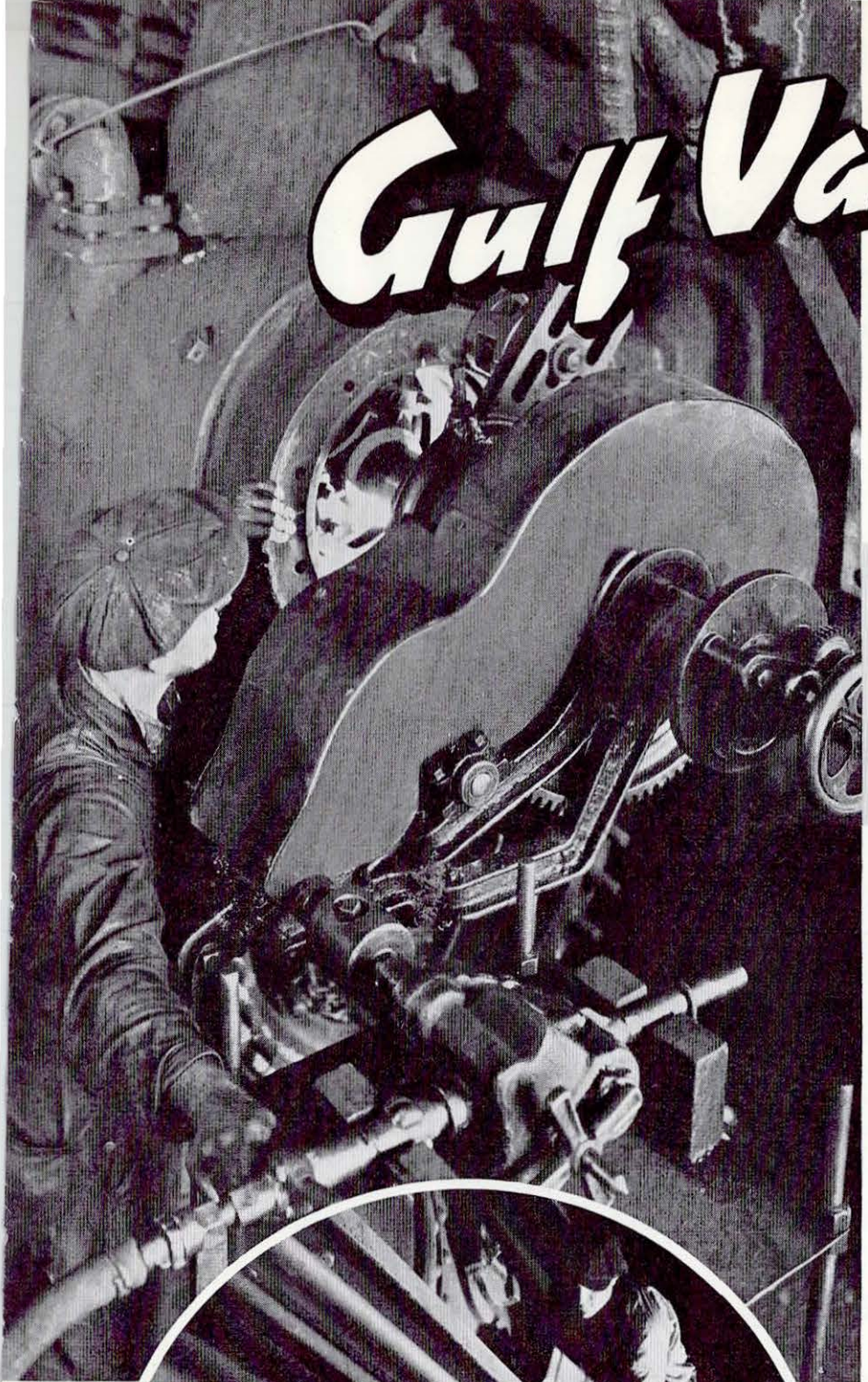
CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh *Chicago*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



Gulf Valve Oil

CUTS REBUSHING COSTS AND TIME-OUT-OF-SERVICE

Shop Costs are only a Small Part of Total Rebushing Costs . . .

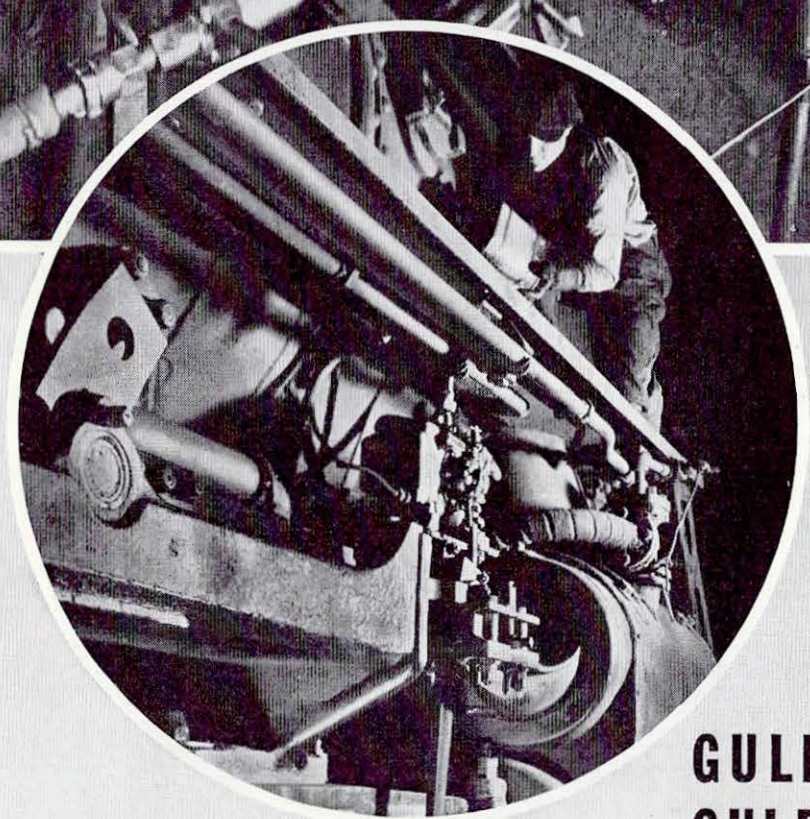
WHEN a locomotive goes in the shop, it means repair expense. That's sure. But shop costs are only a small part of the story. Instead of creating revenue, the locomotive is out of operation—laid up and costing the company money.

Leading roads report that the use of Gulf valve oil has enabled them to get more hours of service from locomotives before cylinders and valves must be rebushed. The high lubricating value of this oil keeps wear at a minimum and increases the intervals between bushing replacements.

Gulf locomotive valve oil atomizes freely, providing complete coverage of valves and cylinders with a lubricating film. Its high quality insures freedom from gummy deposits and hard carbon.

Ask a gulf representative how the use of Gulf valve oil can save you money.

GULF INDUSTRIAL LUBRICATION

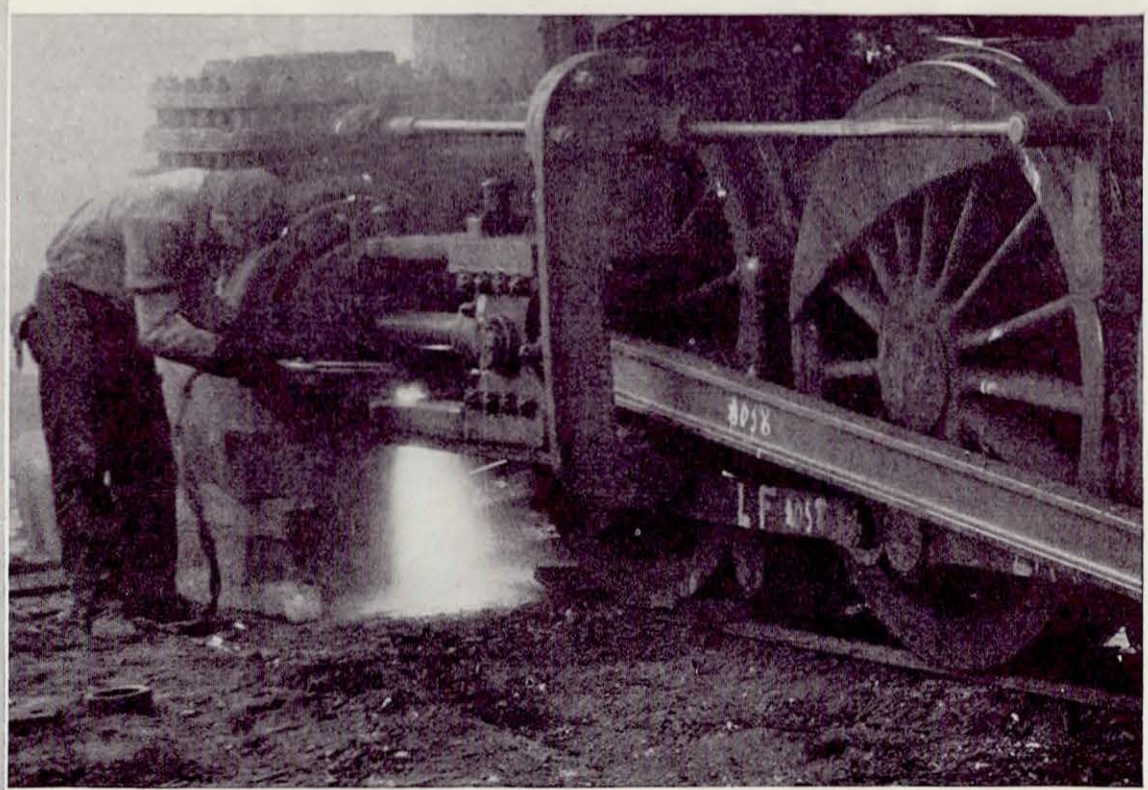


GULF OIL CORPORATION
GULF REFINING COMPANY

General Offices, Gulf Building, Pittsburgh, Pa.

There's MONEY

in scrapping old locomotives!



Are you getting your share?

You can turn obsolete locomotives and rolling stock into cash at the greatest profit by oxyacetylene cutting. An active market exists for scrap steel, and, in addition, many costly parts can be salvaged.

The use of clean-cutting, economical equipment assures you of getting the most from your scrap cutting. Airco Railroad Customers have reduced their scrapping costs to a minimum thru the combination of Airco Oxygen and Acetylene, Airco-DB Apparatus, and Engineering Assistance. Our engineers would be glad to discuss your scrapping problems with you and furnish you with detailed cost data.

AIR REDUCTION
SALES COMPANY
General Office: 60 East 42nd Street, New York, N. Y.
DISTRICT OFFICES IN PRINCIPAL CITIES

This pipe has shed its Scale . . .

two hands full

NATIONAL *Scale Free* PIPE

"It's Spellerized"

NATIONAL Scale Free Pipe is exactly what the name implies . . . *pipe free of mill scale*—clean and smooth inside as well as out.

In all NATIONAL butt-welded Pipe (Sizes ½ inch to 3 inches) a special process invented and developed by National Tube Company mechanically removes the welding scale from both interior and exterior. The pipe reaches you smooth and clean. No scale is left to clog small orifices, to injure meters, or otherwise interrupt service. Damage to valves is prevented. By getting rid of mill scale, which is strongly electro-negative to pipe metal, we eliminate the prime source of corrosion, pitting, and pipe deterioration. That is why NATIONAL Scale Free Pipe lasts longer in service, maintains its ability to deliver full capacity, keeps pipe line maintenance low.

NATIONAL Scale Free Pipe is strong and ductile, threads well, flanges readily, coils and bends satisfactorily. It is uniform in metallic structure, in diameter and wall thickness. Thorough testing and inspection assure its high quality.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Performance Counts

WITH

INDUSTRIAL BROWNHOIST

FOR HEAVY ERECTION WORK

40 feet per minute single line speed. Rotating speed—1⅛ r.p.m.

●

FOR HIGH SPEED BUCKET WORK

250 feet per minute single line speed. Rotating speed—in excess of 3¼ r.p.m.

●

FOR SWITCHING SERVICE

3⅛ m.p.h. in low—15 m.p.h. in high.

AND THEY CHOSE AN F-M 36 TO DO IT!

● When specifications for this rugged 50-ton locomotive crane had to be met by Industrial Brownhoist, its power plant presented a problem. The Diesel selected had to have plenty of power and stamina in reserve for heavy erection work—yet be light and economical enough to fit both the space and cost requirements that traveling crane work imposes.

So they chose an 8-cylinder 5½" x 7½" F-M 36.

After installation and testing, the engineers' reports came through—"The performance of your engine in the extensive tests we have made on this crane has exceeded the expectations we had for it."

For full information on the F-M Model 36 Diesel for powering mobile and stationary equipment of every type, address Department O701, Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 34 branches at your service throughout the United States.

6853OA40.109

FAIRBANKS-MORSE *Diesel Engines*

106 YEARS OF PRECISION MANUFACTURING

POWER, PUMPING AND WEIGHING EQUIPMENT

With a potential yearly capacity of 200,000 tons the position of the AMERICAN STEEL FOUNDRIES in the steel casting industry has been well known for many years.

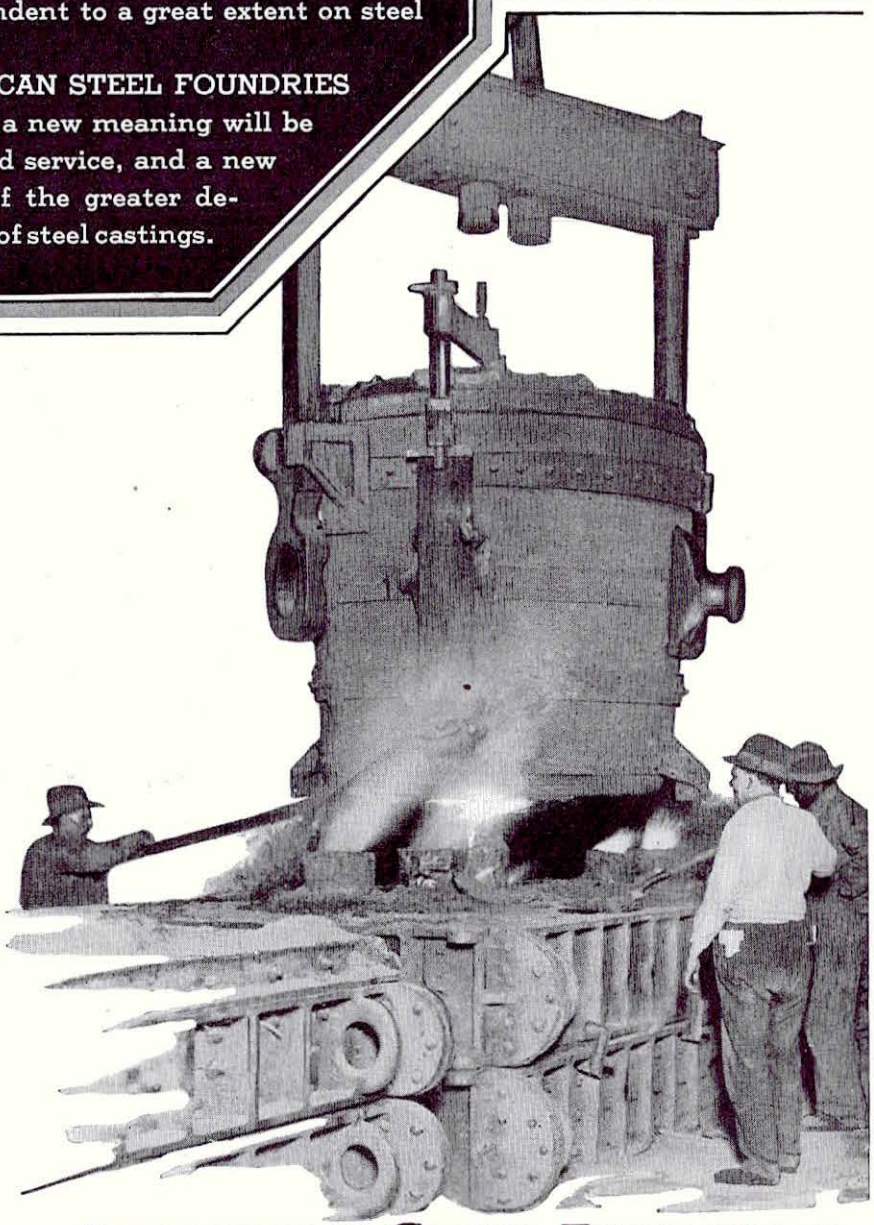
With its wealth of organization, engineering ability and resources, it has been a pioneer and leader in the advancement of methods and processes for the production of quality steel castings.

Lightness, strength, purity, homogeneity and ability to resist shock and torsional strains, characterize steel castings and explain why they have been adapted so extensively by manufacturers of agricultural, mining, tractor, railroad and other equipment. The three basic industries, preparation of food, clothing and transportation, around which all others revolve, are dependent to a great extent on steel castings.

In the use of AMERICAN STEEL FOUNDRIES cast steel products a new meaning will be given to the word service, and a new idea gained of the greater dependability of steel castings.

SPECIFY STEEL CASTINGS

MANUFACTURERS AND ENGINEERS KNOW AND TRUST THEM



AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

GOOD HEALTH FLOWS TO THE NATION BY RAILROAD

● On green slopes of the farm counties is found the most potent health insurance policy in the world—the dairy herds. Tens of millions of city dwellers depend for health and happiness on the butter, cheese and milk from these herds.

But the dairy farmer cannot peddle his products. In our modern civilization the railroad serves as a vital link between the dairy country and its market. Only through this service of transportation is the present dairy industry made possible.

In developing insulated refrigerator cars for use in this vital industry, American Hair & Felt Company and Dry-Zero Corporation are proud to have played a part. They have helped railroad car designers solve insulation problems in every type of refrigerator car now in service. And almost all refrigerator cars operated in the United States and Canada are insulated with products of these affiliated companies.

HAIRINSUL—Standard refrigerator car insulation.

DRY-ZERO—The most efficient and lightest weight low temperature insulation known—standard for low temperature cars.

SALAMANDER—For over 30 years the standard insulation for passenger cars.

LIGHT-WEIGHT SALAMANDER—For insulating light-weight, high speed passenger cars.

CARINSUL—Made especially for insulating the letter board of passenger cars.

OZITE STANDARD HAIR FELT—Made by the genuine original platen or felted process and universally recognized as the highest standard of felted insulation.

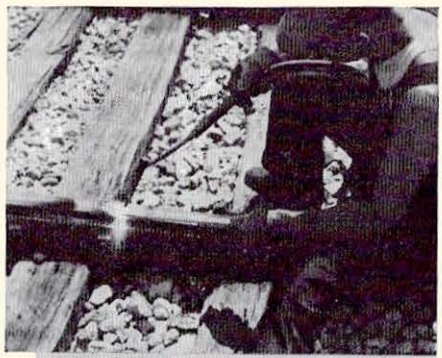
LIGHT-WEIGHT AIR CONDITIONING HAIR FELT—For insulating air ducts.

DRY-ZERO ECONOMY ICE BLANKET—For reducing ice meltage on platforms and in transit.

AMERICAN HAIR & FELT COMPANY • DRY ZERO CORPORATION
(Railroad Division)

Merchandise Mart Chicago

Building up battered rail ends *by Welding* makes old rail *as smooth as new*



Building up the rail end by depositing weld metal.

Shaping the weld metal roughly to rail contour.

Battered rail ends built up by the Oxweld process wear better than new. The deposited weld metal is harder than the original rail. Thus a smooth-riding rail is obtained at a small fraction of replacement cost. During the past year, many thousands of rail joints were renewed in this easy, economical way under Oxweld Railroad Service supervision.

In this and many other ways, Oxweld Railroad Service is helping toward the profitable operation of American railroads. Through almost a quarter of a century, The Oxweld Railroad Service Company has served the welding and cutting needs of a majority of Class I railroads.

THE OXWELD RAILROAD SERVICE COMPANY

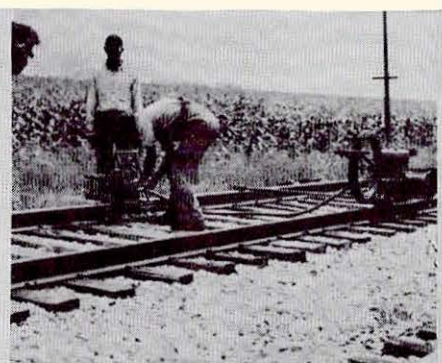
Unit of Union Carbide and Carbon Corporation

New York: Carbide and Carbon Building

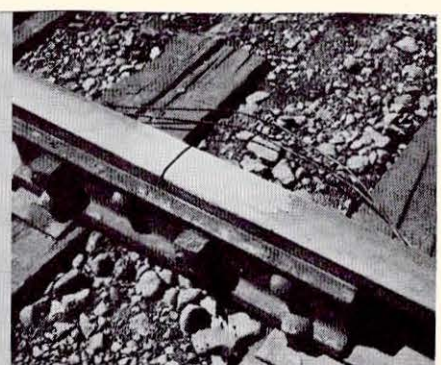
UCC

Chicago: Carbide and Carbon Building

Surface grinding the rail ends to the level of the rail.



Cross grinding the rail ends to allow for expansion.

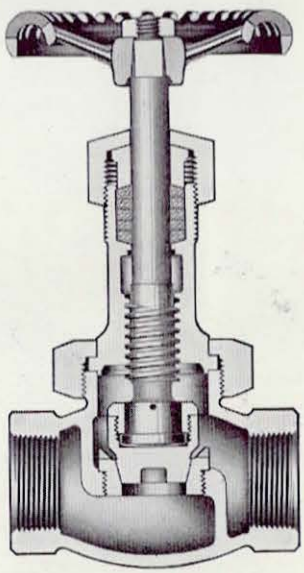


The finished rail ends are as smooth as new.

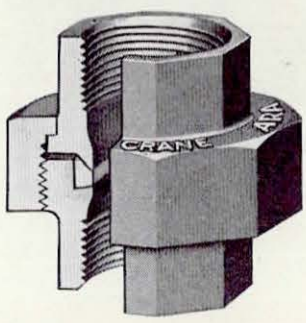
OXWELD RAILROAD SERVICE

LITTLE THINGS COUNT IN *Railroad Piping*

● A little extra care in the inspection of materials, a little more pride in the precision of the craftsman's work and a little closer inspection make Crane A A R Valves and Fittings a little more uniform in quality and a little more dependable in service. That is why most of America's leading railroads have standardized upon them.



Crane A A R Valve



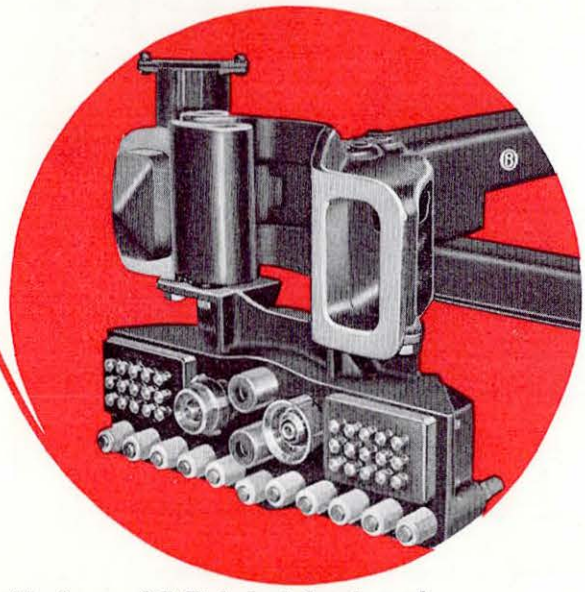
Crane A A R Union

CRANE

CRANE CO., GENERAL OFFICES: 836 SOUTH MICHIGAN AVENUE, CHICAGO
NEW YORK: 23 W. 44TH STREET
Branches and Sales Offices in One Hundred and Sixty Cities

RAILROAD VALVES, FITTINGS AND PLUMBING FIXTURES

BETTER THAN MAGIC CARPETS!



The famous O-B Tight-Lock Coupler and Train Line Connector showing arrangements for making all steam, air and electrical connections between cars.

Write for Booklet 612-A.

YES, even better than magic carpets are these ultra modern trains. Moving swiftly, smoothly and safely over the rails, they are educating the public to an entirely new standard of travel luxury. And so great is the appreciation of this new-found comfort that the railroads are rapidly winning back their share of the public's transportation dollar.

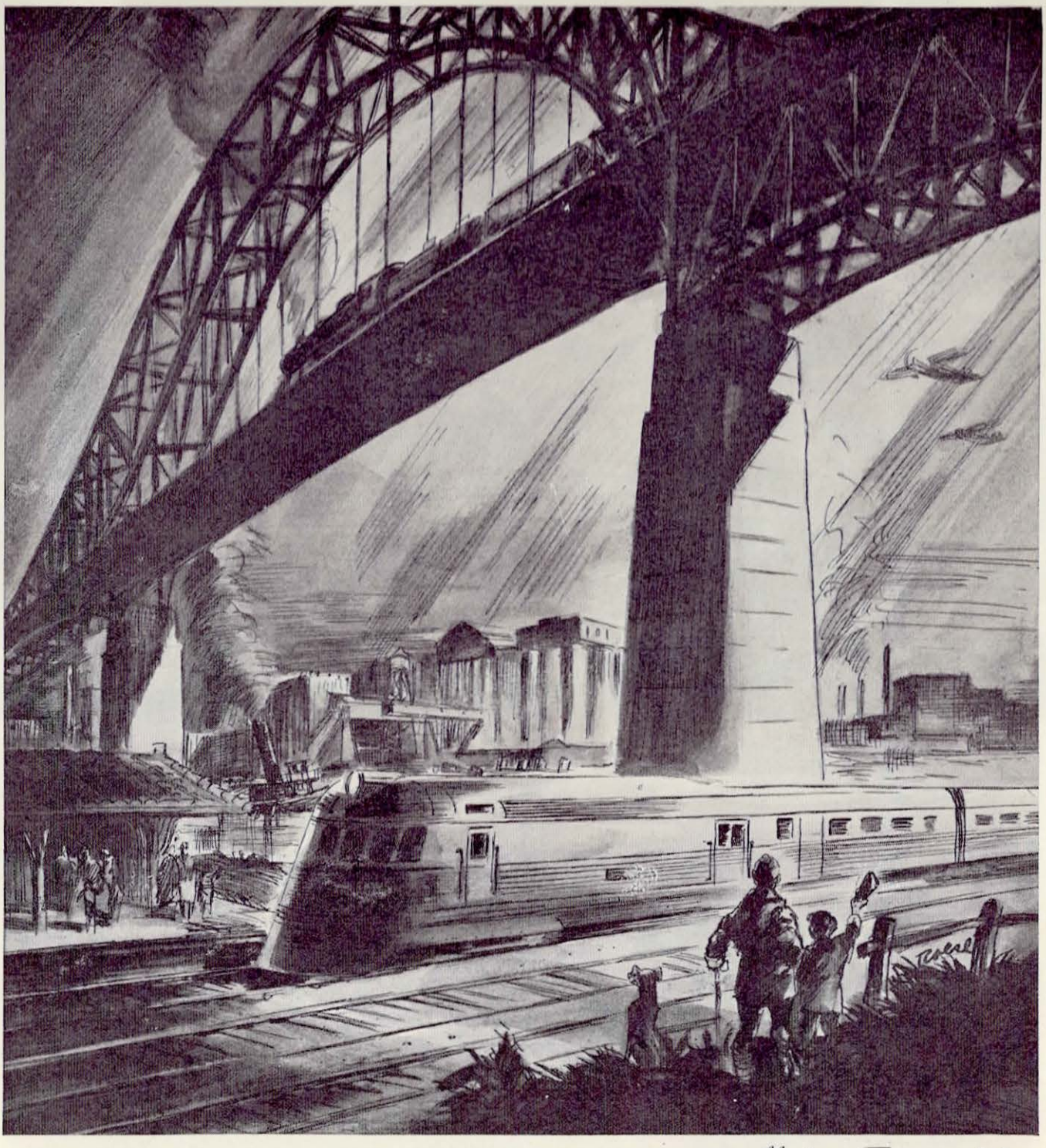
On all of the trains shown here, O-B Tight-Lock Couplers and Train Line Connectors are being used with other modern equipment to set this new standard of passenger comfort and safety. As flexible as any coupling ever devised, yet providing a rigid connection, Tight-Lock Couplers entirely eliminate slack between cars. Trains move as a unit without jarring, jolting, or noise. The train line connector automatically completes all air, steam, and electrical connections upon impact. Important too, is the fact that O-B couplers intercouple with any standard AAR type. If you are contemplating new trains let the already famous O-B Tight-Lock Coupler and Train Line Connector help you to obtain greater passenger comfort and increased revenue.

1890A

OHIO BRASS COMPANY

MANSFIELD, OHIO, U. S. A.

CANADIAN OHIO BRASS COMPANY, NIAGARA FALLS, ONT., CAN.



Modern Transportation

GOOD PROTECTIVE FINISHES ARE A GENUINE ECONOMY

FOR THE special service and maintenance requirements of railway equipment and structures, it will pay to use these "Field-Tested" Pittsburgh Paints: CARHIDE — a revolutionary finishing system for freight, gondola, tank and refrigerator cars. CEMENTHIDE — a high-grade water-proofing system for concrete, cement, brick, stucco and stone. IRONHIDE — an unsurpassed rust protective system for steel bridges and other metal surfaces. STATIONHIDE — "Controlled Penetration" Paint for protecting wood surfaces.

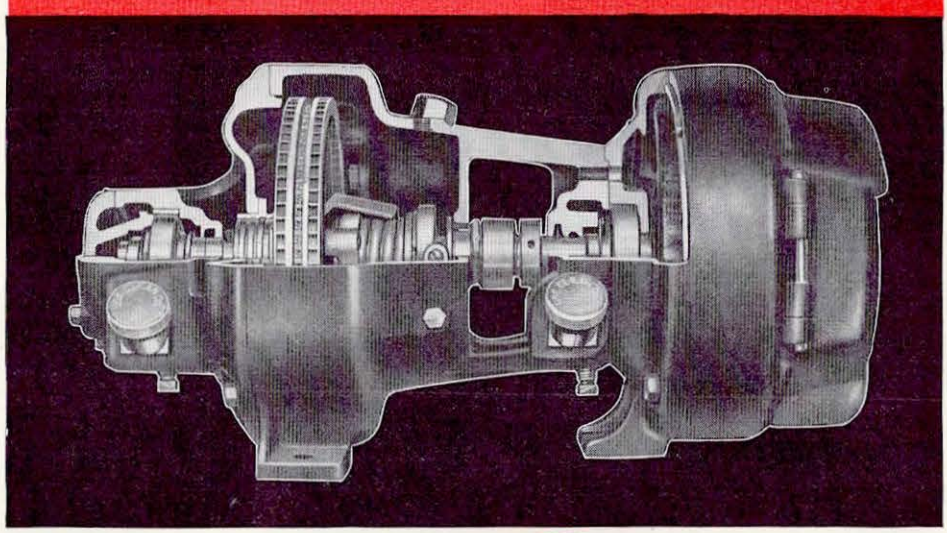
• *An enlarged copy of the above illustration, suitable for framing, may be had by writing to Pittsburgh Plate Glass Co., Paint Div., Pittsburgh, Pa.*

Paint • PITTSBURGH • Glass
PLATE GLASS COMPANY

MODERN

THESE features of the new Type "K-240" headlight generator provide even more dependable service at reduced cost, meeting every requirement of modern operating standards: Improved armature design • 40-bar commutator • Alloy valve and valve cage • Accurate, sensitive governor • Nickel alloy turbine blading • Drop-forged turbine wheel • Rigid, high-carbon shaft • Larger oil cellars • Controlled oil circulation • Oil leakage prevented.

★ Present Type "K-2" equipment may be converted to the modern Type "K-240" machines by the application of interchangeable parts (without additional cost) at regular repair periods.



PYLE-NATIONAL

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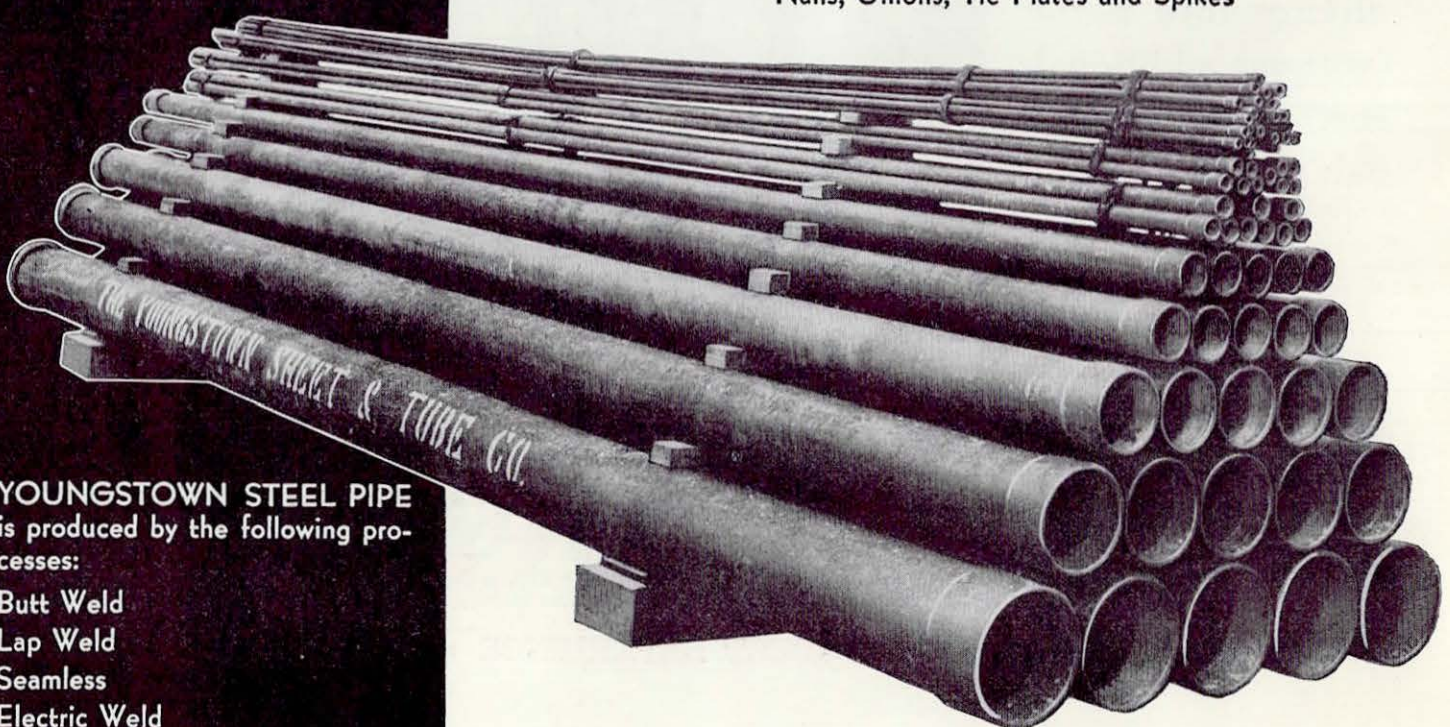

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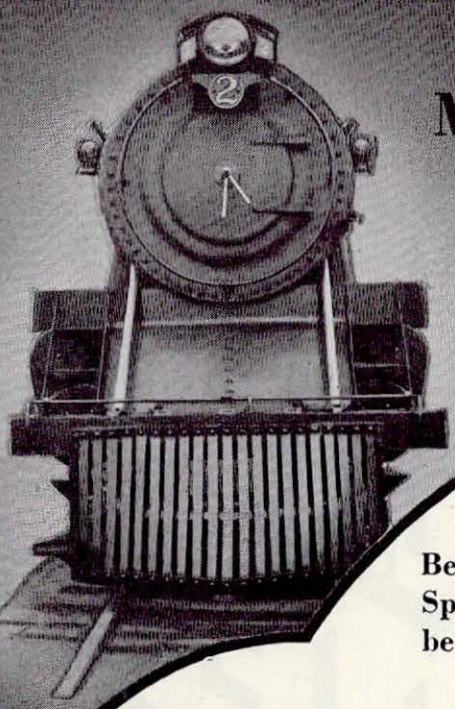
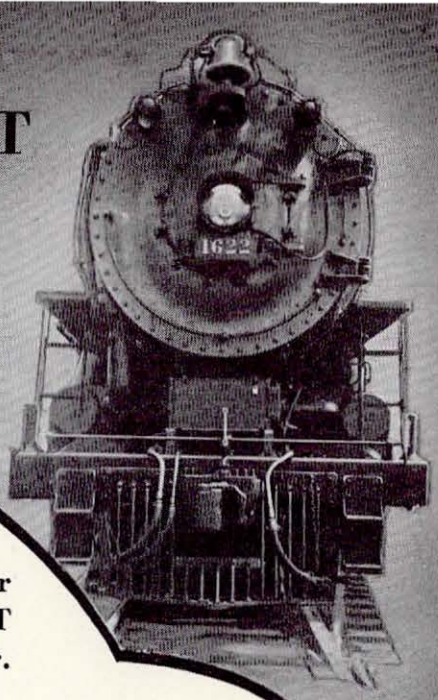
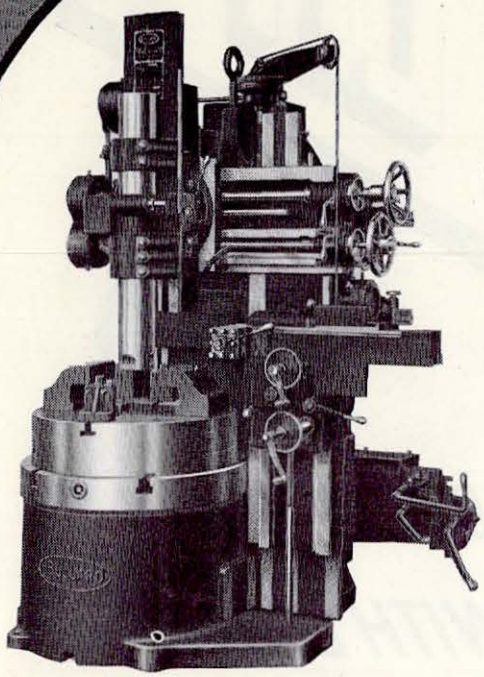


MODERN EQUIPMENT
deserves
Modern Methods of Repair



Beneficial Results of moving traffic at Higher Speeds with Increased Efficiency should NOT be sacrificed by slow Methods of Repair.



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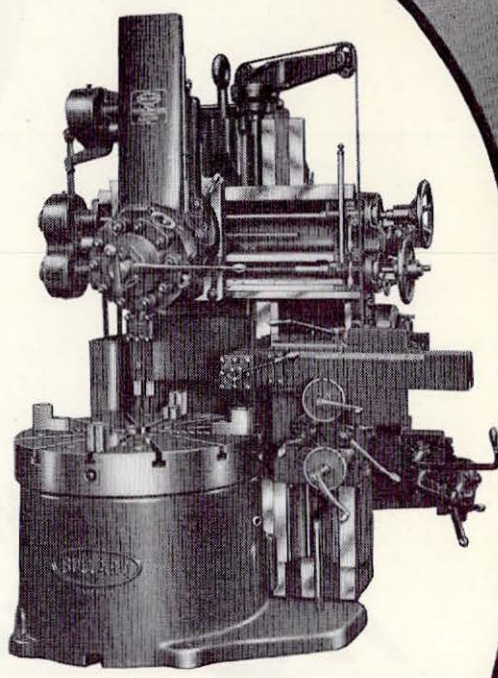

Why not check with your mechanical department as to their shop requirements before disposing of next year's budget?

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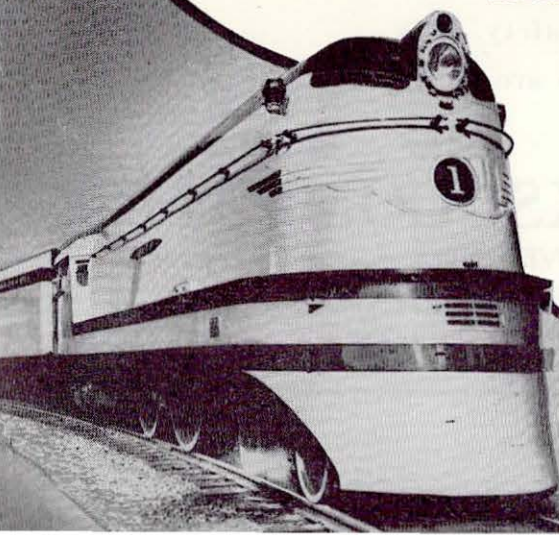

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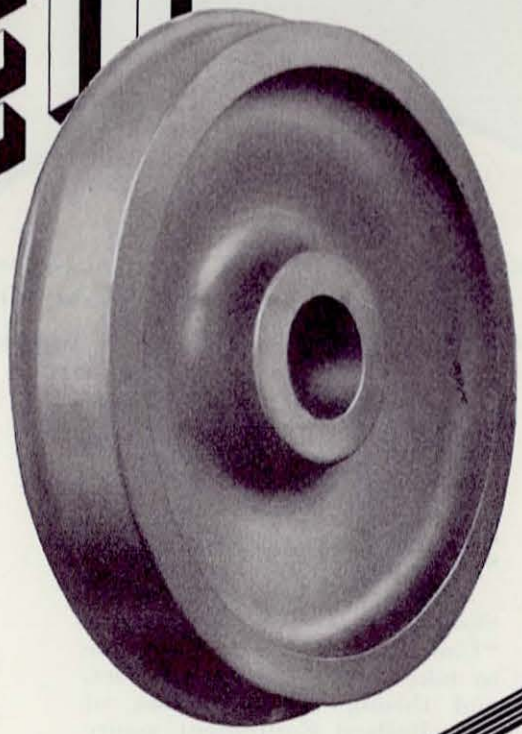

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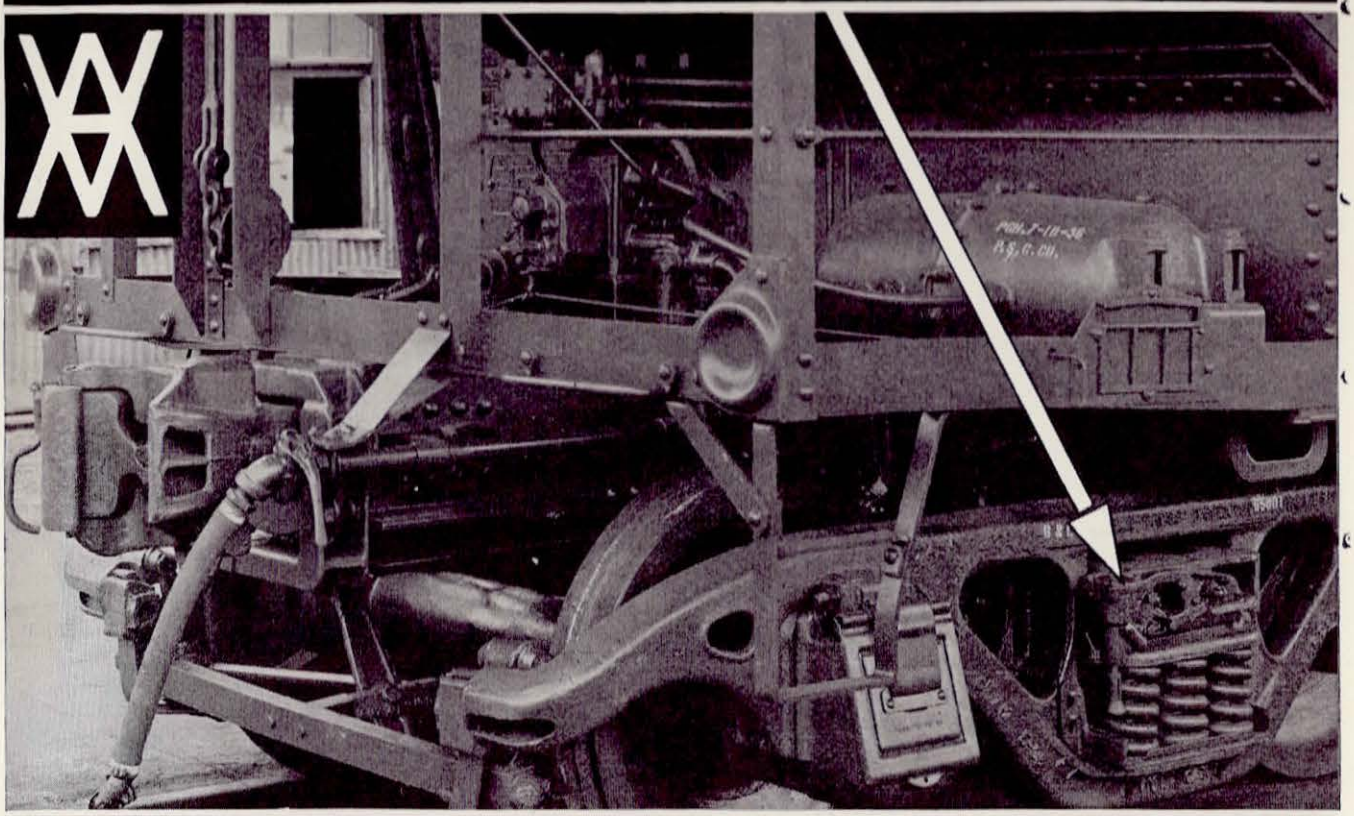
The Latest Development in AUTOMATIC



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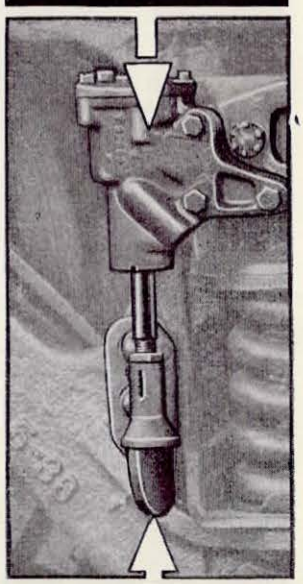

PISTON STOP

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The Week at a Glance

SIX-HOUR DAY: The leading editorial in this issue shows that the 6-hour limitation for the railways, and not upon their competitors, would inevitably reduce railway employment rather than increase it; and, furthermore, that it would curtail purchases by the railways and consequently reduce employment in all industries from which the railways purchase equipment and materials.

●

WAGE RISE DEMAND?: The "big five" train and engine service brotherhoods, it was reported from Cleveland on Wednesday, are cooking up a demand for an increase in pay—and will meet in Chicago in January to decide how much they will ask for.

●

GOLDEN WEDDING: In an unusual testimonial of respect and affection, Union Pacific "old timers," to the number of 1,200, with 150 prominent guests from the "outside," tendered a big banquet to President Carl R. Gray and Mrs. Gray on December 5 in honor of their golden wedding anniversary.

●

FORWARDERS USELESS?: E. A. deFuniak, freight traffic manager of the Louisville & Nashville, testifying at the I.C.C. inquiry into freight forwarding at Chicago gave an emphatic opinion to the effect that the forwarders perform no useful service, but rather are a definite danger to the railroads.

●

H. FITZPATRICK: The talented corporate legal expert of the Van Sweringen systems has been chosen by Messrs. Ball and Tomlinson as head of the top company in the "pyramid."

●

28 LOCOS: Equipment orders continue to be placed in large volume by the railroads. Outstanding among this week's developments are Southern Pacific's orders for 28 locomotives. There are also a number of sizeable freight car commitments and another streamliner in the week's reports.

●

CARLOADINGS: Totaled 680 thousand in the November 28 week, which was 19 per cent up over the Thanksgiving week last year. The total fell below the 1930 week, but in that year the week did not include the holiday.

●

49-TON COACH: The Santa Fe has placed in experimental service between Kansas City and Emporia a standard size Corten steel coach which weighs 49 tons, as compared with 80 tons for the conventional car.

●

TICKEE, NO SEATEE: Paraphrasing the Chinese laundryman and his famous dictum, "No tickee, no shirtee" to one of his customers, Philip Davis, a New York lawyer, tried to recover his fare and $45 damages from the New York Central because on a coach trip to Albany he failed to find a seat. The municipal court in New York dismissed the action and Mr. Davis has not decided whether to appeal or not. One wonders what the transit companies would do if a decision were rendered for the plaintiff in such a case as this.

●

AIR TRAFFIC HIGH: Regular scheduled air lines flew 44 million passenger miles and 425 million pound-miles of express in October, the latter being an increase of about 63 per cent over last year.

●

EXPRESS UP: The Railway Express Agency is sharing in the business upturn too. In October its traffic was 13 per cent greater than in October, 1935.

●

S. I. CROSSINGS FADE: At the rate grade crossings are being eliminated on Staten Island, New York, they will soon be only a memory. As set forth in an article herein, 34 crossings are now being put at separate grade on the heavy-traffic Staten Island Rapid Transit Lines of the Baltimore & Ohio—four projects in all. A few more good bites will about clean up the situation.

●

WHEELER "OBJECTIVE": Hearings in Senator Wheeler's investigation into railway finance opened this week and are reported elsewhere herein. The Senator stated that "propaganda" had assigned a purpose to this investigation quite contrary to what he actually had in mind (alluding to the Senator's government ownership bill, which he says he will not reintroduce). Instead, he said, the hearings would be conducted "objectively towards the welfare of the American transportation system."

●

COTTON BELT PLAN: One by one the roads in the hands of the courts are filing plans of reorganization. This week the St. Louis Southwestern has joined the number. Bondholders have been critical of most of these plans, asserting that they protect the stockholders at the expense of the creditors. The reaction to the Cotton Belt plan appears to be no exception in this respect.

●

TRUCK RATE MINIMUM: Seeing that the I.C.C. has forbidden the eastern railroads to give free c. and d. on shipments rated less than 45 cents per hundred, the Illinois Freight Association railroads have asked the Commission to reopen the case to determine at what minimum rate trucks should be allowed to give free c. and d.

●

PRECIS BY DOWNS: The Illinois Central's chief executive, in an address abstracted herein, tells specifically what the railroads have done in technical and methodological improvements in recent trying years—an encyclopedia in a nut shell; "dollar stretching" heads the list of scientific achievements.

●

"LEAVE TO PRINT": The New York Railroad Club at its annual dinner has developed a painless form of speech-making. Leaders in industry are invited to send messages outlining their views of the railroad situation, and a pamphlet containing these messages is given to each person in attendance; there is no actual speaking. This symposium, reviewed elsewhere herein, gives a cheering view of prospects for the coming year.

●

HOT FEEDWATER: What feedwater heating can accomplish; how to guarantee the heater's constant performance; the test of their efficiency; and a heating method—these are some of the aspects of an important technical subject dealt with in a symposium, reported herein.

●

P.R.R. TRUCKS: The Pennsylvania has signified its desire to acquire directly all of the interest of the American Contract & Trust Co. in the Pennsylvania Truck Lines, Inc.—so as to control directly the trucking operations in which it is interested, rather than by the intervention of a holding company. The I.C.C. had refused to permit acquisition of additional truck lines through holding company control.

●

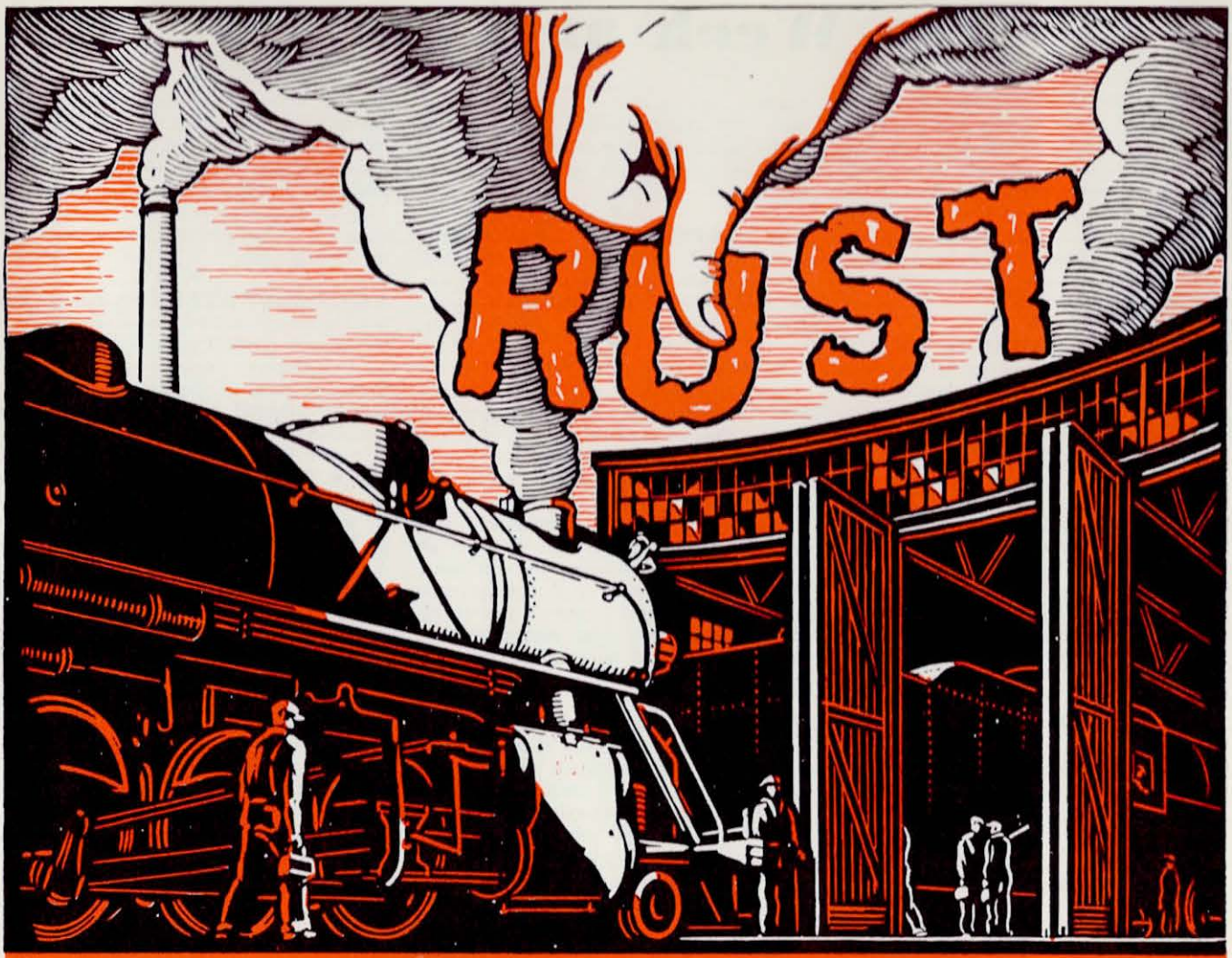
DEPARTMENT PARTY: More than 200 members of the engineering department of the Baltimore & Ohio, from all parts of the system, will attend a departmental banquet at the Hotel Belvedere, Baltimore, this evening, December 12, reviving an old B. & O. custom discontinued a number of years ago. Scattered over 6,400 miles of lines, many of these men will see each other at this party for the first time in months and even years.

●

FEDERAL OPERATION: By now the strategy of those who seek to bring about government ownership of the railways ought to be plain to all. They are not going to discuss the plan on its merits. Instead, the method to be followed is to harass the railroads by restrictive and "make work" legislation and continued favoritism of their competitors, to the end that railroad credit will be ruined, and the government will be the only source of needed capital for all but the strongest carriers. Those who are carrying on the fight against government ownership, it would appear, might well note these tactics—because arguments against government ownership *per se* are not adequate to meet them. The defense against government ownership must be much broader, to include an attack on all the conditions which threaten railway earning power.

●

PRIVATE CARRIERS: Many companies which transport their products in their own trucks nevertheless collect transportation charges from the consignees in addition to the selling price of their goods. Does this bring them under the provisions of the Motor Carrier Act?—many of them would like to know, but as yet the I. C. C. has not been able to give an answer. If it should be in the affirmative, the Motor Act would be greatly widened in its effect.



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RAILWAY AGE

Sane Consideration Versus Political Pressure

The demand of the railway labor leaders for legislation by Congress to establish a 6-hour railway working day at 8 hours' pay raises some very interesting and important questions. It is the only thing that at present clouds the prospect of increasing prosperity for the railways, their employees and the industries from which the railways buy and their employees. It should not be settled by political pressure upon Congress, but by sane presentation and consideration of all that is involved by all those vitally concerned, directly and indirectly. We sincerely believe that this is as much in the interest of railway employees as of others concerned.

The Railway Labor Act requires that "all disputes between carriers and their employees shall be considered, and if possible decided, with all expedition in conferences between representatives designated and authorized so to confer." It also provides for government mediation; for arbitration if mediation fails; and for reference of a dispute, if no agreement to arbitrate can be made, to a commission appointed by the President.

These are provisions for collective bargaining. The labor unions and railways joined in asking their enactment. All labor union leaders claim to favor collective bargaining. The Wagner Industrial Disputes Act declares it is "the policy of the United States" to "encourage" collective bargaining.

Why Not Collective Bargaining?

The Railway Labor Act was passed long before the Wagner Act. Why, then, should the railway union leaders go to Congress for legislation instead of first submitting their 6-hour day demand to the railways and allowing the dispute to be handled by negotiation and the other processes prescribed by the Railway Labor Act? Why should they advocate collective bargaining and legislation requiring it, resort to it in minor cases, and then ignore it in a case of such vast importance?

In 1916, before there was a Railway Labor Act, the train service brotherhoods did submit to the railways their demand for a basic 8-hour day and bargain collectively with them concerning it before seeking legislation by Congress. Do present leaders of railway labor regard collective bargaining concerning hours and wages on the railways as having become outmoded just as the federal government has begun to require it as a specific for destructive labor disputes in other industries? We believe there never was an issue raised which, in the interest of railway employees, more needed the careful consideration that can be given only in conferences with railway managers than the issue of a 6-hour day.

The Adamson Act establishing a basic 8-hour day in train service went into effect in 1917. An 8-hour day for other railway employees was established in 1919. The establishment of the 8-hour day did, for some years, cause a large increase in the number of railway employees. But the railways and their employees were confronted then with conditions very different from those that they are confronted with now and which demand the most careful consideration.

A Great Change in Conditions

The railways had little competition then, it was possible to make a large advance in rates to meet the increased expense and it was made. They have competition on every hand now, and would lose a vast amount of traffic if railway rates were largely advanced and rates by highway and water were not. The loss of railway traffic and consequent loss of earnings would prevent any such relatively large increase in railway employment being caused even temporarily by the establishment of a 6-hour day as was caused by the establishment of an 8-hour day.

This must be plain to the railway labor leaders. Why, then, if they feel they must continue advocating legislation fixing a railway 6-hour day, do they not also advocate legislation fixing a 6-hour working day for employees of carriers by water and highway?

This would create a necessity for advances in the rates of all carriers, which, if made, would reduce the loss of traffic and earnings the railways would suffer and increase the number the railways would be able to employ. If the objective of the railway labor leaders is increased employment by the railways, their advocacy of legislation applicable to the railways alone that inevitably would drive traffic from the railways is the poorest possible way of attaining that objective.

Railway employees have carried on years of activity in behalf of federal and state legislation to equalize competitive conditions in transportation. The objective of this has been increased employment on the railways; and it has shown that many thousands of railway employees fully realize that the number of employees the railway industry can pay and what it can pay them depends on the traffic the railways have to handle and the earnings they have available for meeting the payroll. The work of equalizing competitive conditions in transportation has been successful only in small meas-

ure. The railways are still subject to the long-and-short-haul section of the Interstate Commerce Act while their competitors are not. The railways are still otherwise effectively regulated while their competitors are not. The competitors of the railways are still heavily subsidized while the railways are not. The working hours of railway employees even now are much shorter and their hourly wages much higher than those of employees of their competitors.

The Foundation of Railway Employment

Why do not railway labor leaders and employees seek the complete removal of these disparities in competitive conditions before trying first to push through legislation that would greatly increase them? There is only one way to meet competition in transportation, and that is to meet it with rates that are equal in proportion to the value of the service rendered. The railways cannot furnish a service and make rates that will meet the competition of other carriers if forced by both government and their employees to incur unit costs of carrying passengers and freight much higher than those of their competitors. The number of railway employees in October was 190,000 more than at the bottom of the depression. The foundation for a continuing large increase in railway employment must be the establishment of competitive conditions in transportation which will enable the railways to continue to get their share of the increase in traffic occurring. The effort greatly to increase railway labor costs of operation without any corresponding increase in the labor costs of operation of other carriers is an effort to defeat the purpose of all the efforts that have been and are being made to increase railway employment, and especially the efforts to increase it by reducing existing disparities in transportation competitive conditions.

Effect on Employment in Other Industries

The proposed legislation for a 6-hour railway working day does not raise a question merely as regards employment by the railways and other carriers. It raises a question also as regards employment in the manufacturing industry and in industries that produce ore, lumber and other raw materials of manufacture. The annual volume of purchases directly and indirectly made by the railways from these industries is determined by the amount of net operating income they earn and is usually somewhat larger. We have repeatedly demonstrated this, and in 1936, as in previous years of both prosperity and depression, the rule has been holding good. In the first nine months of this year railway net operating income increased to $435,000,000, and purchases of equipment and materials increased to about $500,000,000—an advance of 65 per cent over the same part of 1935. At the rate buying has been done in October, November and December the year's increase may be 75 per cent or even more.

This increase in railway buying has caused a substantial increase of employment in other industries. The inevitable effect of a large increase in railway operating expenses without an advance in rates that would not drive traffic away would be a great reduction of net operating income. This would inevitably cause a corresponding reduction of railway buying, resulting in a large reduction of employment in the manufacturing industry and the industries that supply it. Do labor leaders and railway employees who advocate legislation to *increase employment on the railways* believe they can fairly disregard the direct tendency and almost certain effect it would have of *reducing employment in the manufacturing and other industries?* If so, they are hardly in a position to criticise capitalists for disregarding the supposed selfish interests of everybody but themselves.

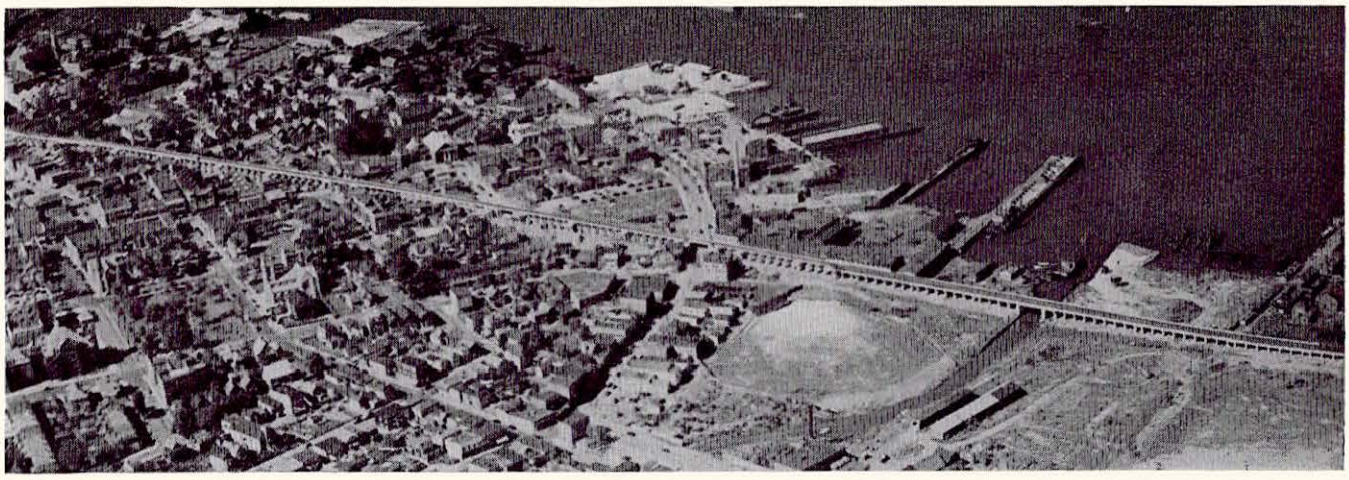
Railway employees are not now underpaid as compared with other workers, and therefore no good argument can be made for legislation to increase their leisure and hourly wages that would deprive other workers of employment. The manufacturing and other industries and their employees that would be adversely affected should certainly have something forcible to say to Congress before it passes proposed legislation that so greatly concerns them.

Two Vitally Important Facts Regarding Employment

Two vitally important facts regarding employment are demonstrated by railroad statistics. One is that the *total railroad payroll* is, on any given basis of passenger and freight rates, *determined by gross earnings* and is almost a fixed percentage of them. In 1930, when gross earnings were $5,281,200,000, the payroll was 45 per cent of gross earnings and the number of employees was 1,488,000. In 1935, when gross earnings were only $3,452,000,000, or 33 per cent less than in 1930, the payroll was again 45 per cent of gross earnings, and the number of employees was only 994,000, or 32½ per cent less than in 1930. Increase the average hourly railway wage by legislation as proposed without doing anything to *increase railway gross earnings*, and railway managements will, as a matter of necessity, soon find ways to *curtail employment* so that payroll will soon again be about 45 per cent of gross. Unit labor costs may be increased by legislation. The payroll cannot be; and total payroll divided by the average wage per employee determines the number of employees.

The other vitally important fact referred to as being demonstrated by railway statistics is, as has already been stated, that the volume of railway buying from the manufacturing industry is determined by the amount of railway net operating income earned. Therefore, adopt legislation which, by increasing operating expenses more than gross earnings, will curtail net operating income, and there will be a reduction of railway buying and a reduction of employment in the industries from which railway buying is done.

If legislation for a 6-hour day at 8 hours' pay on the railways is to be passed, *and is not to reduce total employment in the country instead of increasing it*, it must be accompanied by action which will increase railway gross earnings and increase them enough to allow continuance of the increases of railway net operating income and railway buying now occurring.



Looking North Over the Viaduct of the Port Richmond Project, Which Eliminates Eight Grade Crossings

Grade Crossings Are Disappearing Rapidly on Staten Island

Four projects under way on rapid transit lines of the Baltimore & Ohio, involving long sections of track elevation and depression, will remove 34 intersections

ONE of the most extensive programs of railway-highway grade crossing elimination now in progress in the country is that under way on the Staten Island Rapid Transit lines of the Baltimore & Ohio, on Staten Island, N. Y., the Borough of Richmond of greater New York City, where, in four separate projects, 34 grade crossings are being eliminated at a total cost of approximately $6,000,000. This work, which is confined to 24 miles of lines handling unusually heavy traffic, involves variations in general treatment and in methods of handling train movements, and a wide range of structure design and of methods of construction. It includes track elevation on earth embankments and on long concrete viaducts; long sections of track depression; both elevated and depressed streets; several types of railway and highway bridges; a number of new passenger stations, and, in all cases, calls for either intensive single-track operation in restricted areas directly alongside construction operations, or the detouring of traffic over long sections of temporary tracks entirely outside the sphere of the work.

The work under way at the present time, all of which was started in 1935, is being carried out under the provisions of the New York City Grade Crossing Elimination Act. However, the large extent of the program was made possible by a grant from the Federal Emergency Administration of Public Works, amounting to 30 per cent of the construction cost. The remainder of the cost, including the share borne by the railroad, is being financed with funds derived from the State bond issues provided for in the act mentioned above.

At the present time, the program as a whole is approximately 80 per cent completed, although certain of the projects will not be completed until early in 1937. The largest and most interesting structures being built are two double-track reinforced concrete viaducts, one 3,877 ft. long, eliminating 8 grade crossings, and the other, 1,565 ft. long, eliminating 5 additional grade crossings. The shorter of these viaducts was completed as a whole, without interfering with traffic, while the longer viaduct is being constructed one-half at a time, with single-track train operation over the original eastbound track during the first stage of the work, and over the completed half of the viaduct during the second or final stage of construction.

A Birds-Eye View of the Island

Staten Island, with an area of approximately 57 sq. mi. and a population of approximately 175,000, lies directly at the mouth of New York bay, along the east coast of New Jersey, from which it is separated by the Arthur Kill, a navigable waterway of considerable width. It is connected with New Jersey by three large highway bridges, one single-track railroad bridge and three ferry lines, while its only connection with Manhattan Island (New York City proper), from which it is separated by approximately six miles of water in Upper New York bay, is by means of ferries. These ferries operate on a frequent schedule between the "Battery," at the lower tip of Manhattan, and St. George, on the north shore of Staten Island, and carry thousands of commuters daily, who, for the most part, reside along the north, east and south shores of Staten Island, in numerous towns and residential communities

An Aeroplane View of a Section of the Stapleton Project, Which, as a Whole, Eliminated Seven Grade Crossings

which have grown up along and inland from the lines of the railway.

With a few important exceptions, the industries of the island are concentrated in a narrow belt extending for approximately eight miles along the north and northeast waterfronts. The central part of the island, while now rather sparsely settled, shows promise of a large increase in residential population in the future. The west shore is admirably situated for industrial development, with a deep water channel in the Arthur Kill and a projected extension of the railway, already partly constructed, through and along the rear of the industrial area.

First Railway on Island in 1856

Much of the development of Staten Island industrially, and as a large residential area with hundreds of community commercial and shopping centers, has been due directly to its rapid transit lines, operated by the Staten Island Rapid Transit Railway Company, a subsidiary of the Baltimore & Ohio. The first railway line on the island, known as the Old Line, was constructed during the years 1853 to 1856, and extended from Stapleton, near the northeast tip of the island, to Tottenville, near the southwest tip, a distance of approximately 14 miles. This line, double-track, which for the most part lies approximately one mile inland from the east and south shores, was served by ferries at both ends, operating to New York City proper and to Perth Amboy, N. J.

In 1886, this original line was taken over by the Baltimore & Ohio, which moved the New York ferry terminal to St. George, about a mile further north, and then constructed a double-track line along the north shore, across the Arthur Kill, to Bayway, N. J., and thence to a connection with its tracks at Cranford Junction, N. J., about four miles from the river crossing. This later line, which is approximately eight miles in length on the island, was built directly along the waterfront of the Kill Van Kull and Newark bay for a distance of about 3½ miles from St. George, and was then continued westward further inland to its crossing of the Arthur Kill west of Arlington station. Shortly after the completion of this line, the B. & O. also built what is known as the South Beach line, a branch approximately two miles long from Clifton station, on the Tottenville line, to South Beach. This latter line now serves a number of large residential communities, and also provides service to several large bathing beaches. With its completion, the line mileage of the Staten Island Rapid Transit Lines was brought up to 24.

There are two sizable railway yards on the island, one at Arlington, immediately east of the crossing of the Arthur Kill to New Jersey, and the other at St. George. The passenger terminal at St. George is by far the most important passenger facility on the road, where on 12 relatively short platform tracks, approximately 493 trains are handled every 24 hours, with a peak of 31 trains inbound and outbound during the rush-hour periods of the morning and evening.

The Bay Street Grade Crossing Elimination, Started in 1931, Directly at Clifton Station, Was One of the Most Difficult, Yet Effective Projects Carried Out Prior to the Present Large Program

Heavy Traffic on All Lines

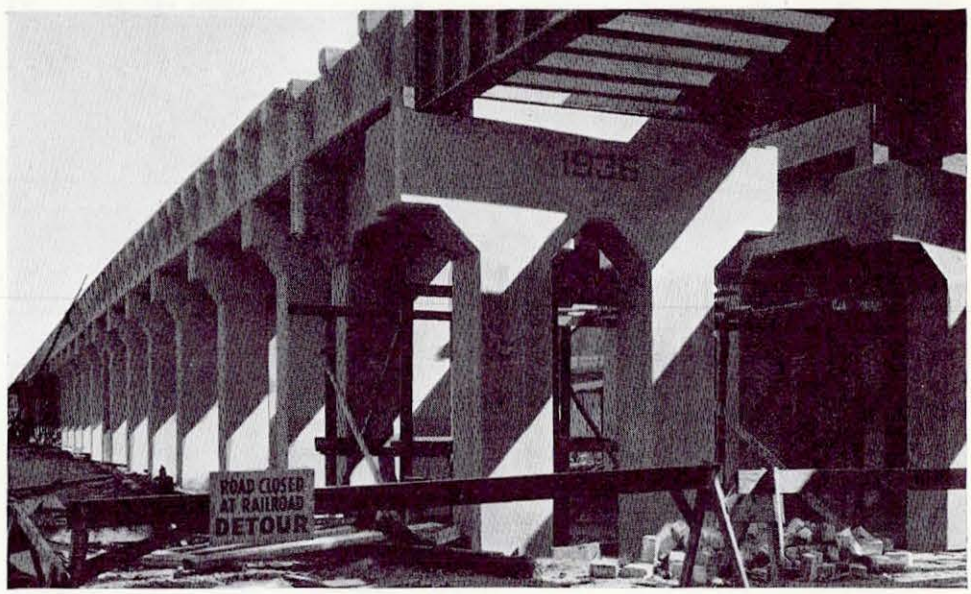
The increase in population on Staten Island has been gradual over the years, and, to a large extent, such increase as has occurred has been largely along and in the vicinity of the lines of the railway. This brought increased passenger and freight business to the railway, but also with it, the development and growth of towns and communities, with additional and more intensively used grade crossings.

With the development of the automobile and the higher speeds of train operation, the grade crossing situation on the island began to loom into importance; it was still further accentuated by the electrification of all of the lines in 1924 and 1925. Since 1925 all passenger service has been with multiple-unit, subway-type

equipment, with trains varying from one to six cars in length. All freight service, however, has continued to be handled by steam power.

At the present time, there are 161 scheduled passenger train movements over the North Shore line, 162 such movements over the South Beach line, and 170 such movements over the Tottenville line daily. This service provides for a normal 15-min. headway on all three lines during the day and most of the night, and a rush-hour headway morning and evening of four minutes.

Much of the passenger service is local in character, making all stops, but during the commuting hours, between 7:30 and 9:00 a. m. and between 5:00 and 6:30 p. m., a number of express trains are operated on each of the lines. In this express service, on the Tottenville line for example, rush hour trains run from Great Kills to St. George, and vice versa, a distance of about 8 miles, in 19 minutes. Interspersed between these intensive passenger train schedules are 20 scheduled freight movements daily, 10 on to the island and 10 leaving the island, in addition to a number of local and extra freight movements.



This Section of Viaduct Through Stapleton is More or Less Typical of the 5,442 Ft. of Double-Track, Reinforced Concrete Viaduct in the Port Richmond and Stapleton Projects

First Grade Separation in 1913

The first step in the elimination of grade crossings on Staten Island was taken in 1913, at which time there were a total of 96 grade crossings on the three lines. In that year, structures were built at three important crossings—at Hylan boulevard, Rosebank, on the South Beach line, which eliminated three crossings, and at the crossings of Amboy road in both Great Kills and Huguenot, on the Tottenville line. The first mentioned project was effected by carrying the boulevard over the tracks, while the latter two were accomplished by a combination of track elevation and roadway depression.

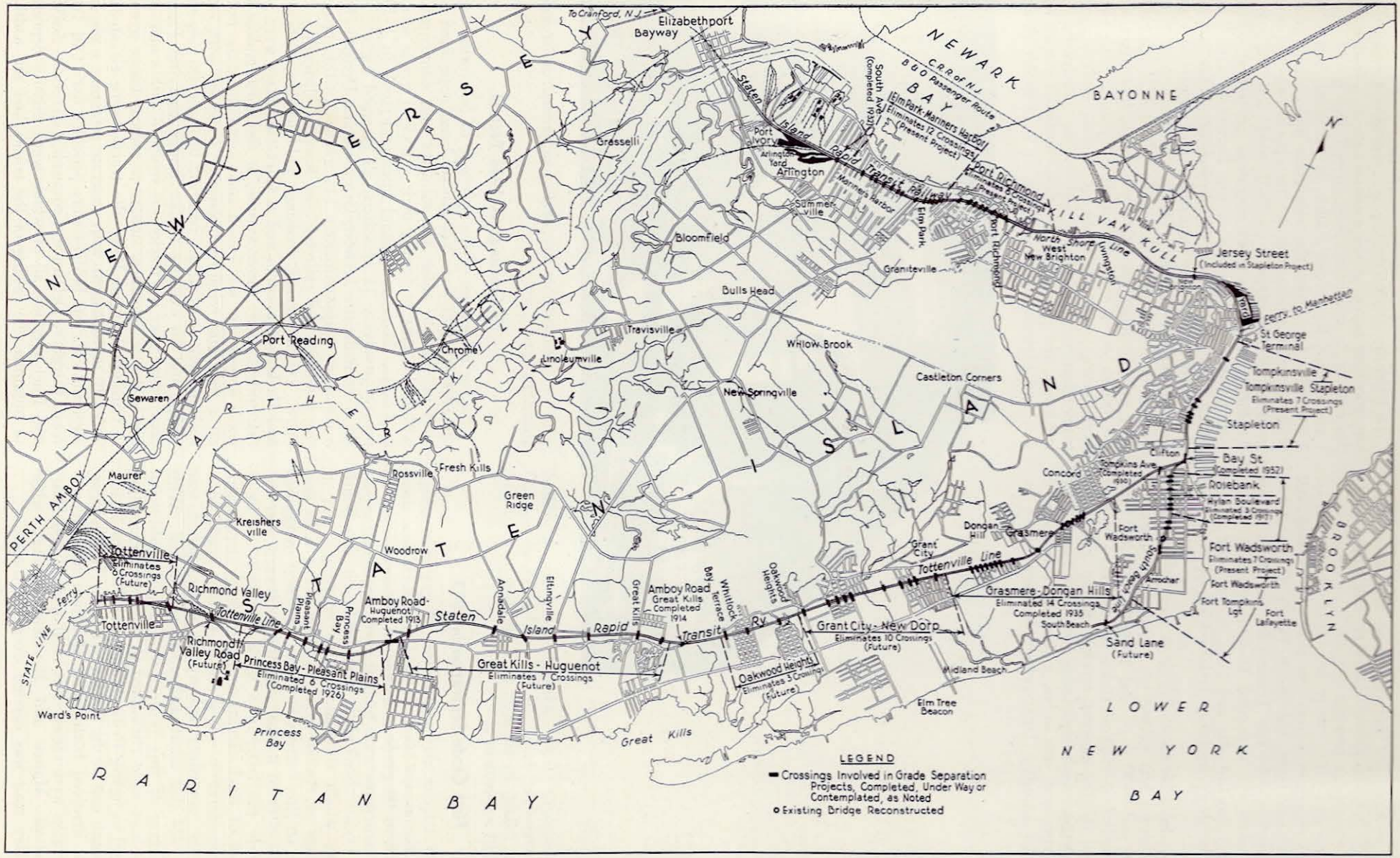
Much consideration was given to further grade separation in the immediate subsequent years, but it was not until 1924 that additional work was started. With the completion of this project in 1926, six additional grade crossings were eliminated in a project extending between and including Princess Bay and Pleasant Plains, near the south end of the Tottenville line. In this project, which involved both track elevation and depression, the tracks were raised over Amboy road and Sharrot, Woodvail, Manee and Bayview avenues, while Princess Bay road was carried over the tracks.

In 1930 the grade crossing at Tompkins avenue, Clifton, was eliminated by the construction of a bridge over the railway; a new street was carried over the tracks at Page avenue, Richmond Valley, at the south end of the Tottenville line; and the clearance under the railway bridge over Virginia avenue, Rosebank, was improved by lowering the street. In 1931 work was started on the large and costly track elevation project at Clifton station, near the junction of the Tottenville and South Beach lines, resulting in the elimination of the crossing at Bay street and the improvement of overhead clearance at Willow avenue. The grade crossing at South avenue, Arlington, near the west end of the North Shore line, was eliminated in 1932 by carrying this street over the tracks on a concrete I-beam structure with earth embankment approaches. In all of these early projects, track elevation was carried out by the construction of earth fills, and practically all of the bridges for both railway and highway loadings were of steel girder design, with or without concrete decks, supported on concrete abutments and piers.

15 Crossings in 1933 Project

Taking advantage of the privilege of borrowing from the $300,000,000 New York State bond issue fund created in 1925 to assist the railways and municipalities within the state to finance their shares of grade separation costs, the Staten Island lines undertook in 1933 a project involving 15 crossings, all grouped together on the Tottenville line between Grasmere and Dongan Hills, a distance of approximately 1½ miles. In this project, the grade of the railroad was lowered through Grasmere; existing grade crossings at Sheridan, Grasmere and Parkinson avenues and at Garretson place were permanently closed; Clove avenue, at the north end of the track depression, was raised and carried over the tracks on a steel and reinforced concrete structure with earth embankment approaches retained by concrete retaining walls; and an existing timber bridge carrying Fingerboard road over the tracks was replaced with a new steel and concrete structure, similar to that at Clove avenue.

Through Dongan Hills, the tracks were elevated on an earth embankment with concrete retaining walls, and steel and concrete bridges were provided over Old Town road, Burgher, Delaware, Cromwell, Garretson, Seaview and Buel avenues, all of which were slightly depressed to minimize the raising of the tracks and the width of



Map of Staten Island, New York, Showing the Lines of the Staten Island Rapid Transit Railway (Baltimore & Ohio), and the Progress Which Has Been Made in the Elimination of Grade Crossings Since 1913—Note Four Large Present Projects Involving the Elimination of 34 Crossings

the resulting embankment. In this same area, Tysen and Liberty avenues were closed across the railroad. This project, which was completed in the early part of 1935 at a cost of approximately $1,800,000, overlapped an even larger program of grade crossing elimination undertaken in 1934 and 1935.

Four Projects, 34 Crossings in 1934-1935 Program

The 1934-1935 program, which was begun in September, 1934, and which is still under way, includes 34 crossings in four separate projects. This program, which has been made possible by P.W.A. financial assistance, is estimated to cost approximately $6,000,000, an amount practically equal to the total cost of all previous grade separation work on the island. The percentage of completion of the different projects at the present time varies, but it is estimated that the program as a whole is approximately 80 per cent complete, with the expectation that some of the finishing work will extend over into the spring of 1937.

The four projects in this latest program are located through Stapleton, on the section of main line common to both the Tottenville and South Beach lines, where 7 crossings are involved; through Fort Wadsworth, on the South Beach line, where 7 crossings are involved; from Port Richmond to Tower Hill, on the North Shore line, where 8 crossings are involved, and from Elm Park to Mariners Harbor, also on the North Shore line, where a total of 12 crossings are involved. Of these projects the Stapleton and the Port Richmond—Tower Hill projects involve track elevation, while the Fort Wadsworth and Elm Park—Mariners Harbor projects involve essentially track depression. At most of the streets involved in the program, there is a compromise between track elevation and street depression, or track depression and street elevation, as dictated by considerations of economy and feasibility.

The most unusual feature of each of the track elevation projects is a long double-track reinforced concrete viaduct. The Port Richmond—Tower Hill viaduct is 3,877 ft. long and the Stapleton viaduct 1,565 ft. long. In each case the viaduct is supplemented by long earth embankment approaches.

The viaduct on the Port Richmond—Tower Hill project is being constructed one-half at a time, the north half for the westward track having been completed and put in service in August. The south half of the viaduct, now under construction, will be completed about the first of the year. The viaduct on the Stapleton job, on the other hand, was completed for both tracks at the same time, and was put in service as a whole in October.

Port Richmond and Stapleton Projects

In the Port Richmond—Tower Hill project, the track elevation, with its long viaduct, is approximately on the old alinement, extending from a point about 500 ft. west of West Brighton station to about 2,000 ft. west of Tower Hill station, a distance of approximately 7,000 ft. Bridge structures, forming a part of the viaduct structure, will extend over the following thoroughfares in order from east to west: Richmond Terrace, Park, Richmond and Maple avenues, Faber street, and Sharpe, Treadwell and Nicholas avenues. In addition to the bridges over these thoroughfares, each of which will eliminate an existing grade crossing, a new double-track girder bridge of 42-ft. span is being constructed over Bodine creek, just east of Richmond Terrace, to replace an existing bridge at the old track level. Of the street bridges, four are of the through plate girder type with a reinforced concrete deck; three are of the concrete encased I-beam type; and one employs wide flange beams with a reinforced concrete deck.

During the construction of the first half of this project, single-track train operation was maintained immediately alongside on the right-of-way, which is only 40 ft. wide and, for the most part, hemmed in by occupied property. That this train operation added appreciably to the complexity of the many details of construction work, particularly the deep foundation excavation work, is appreciated when it is realized that there were more than 180 movements past the work daily, the large majority of which were during the working hours of the day.

The Tompkinsville—Stapleton project, which is more or less similar to the Port Richmond project, except in details of construction, extends from Victory boulevard in Tompkinsville, to a point approximately 300 ft. north of the Clifton station, with the tracks elevated on a reinforced concrete viaduct or earth fill through a distance of approximately 5,200 ft. In this project, a grade crossing at Victory boulevard is being eliminated by the construction of an overhead steel and concrete bridge 340 ft. long over the tracks at Hannah street, approximately 600 ft. south of the boulevard, which is being closed permanently, and by the provision of a steel and concrete pedestrian bridge 265 ft. long over the tracks directly at the boulevard. Through the track elevation section of the project, grade crossings at Wave, Prospect, Water, Canal and Thompson streets have been eliminated. This project also covers the elimination of the isolated grade crossing at Jersey street, New Brighton. The bridges over the streets in this project are of two types, encased I-beams and half-through girders, both with concrete decks.

Elm Park—Mariners Harbor Project

In the Elm Park—Mariners Harbor grade separation project, the railway tracks, with some modification in original alinement, are being depressed from a point approximately 1,100 ft. east of Elm Park station to a point about 2,600 ft. west of Mariners Harbor station, a total distance of approximately 6,800 ft., while a double-track detour carries all train movements around the work. In this project, which, when completed, will have involved approximately 250,000 cu. yd. of excavation, 10 thoroughfares are being carried over the tracks, while 2 others are being closed. The thoroughfares where grades are being separated are, in order, from east to west, John street, Morningstar road, Granite, Lake, Simonson, Van Name, Van Pelt, DeHart and Union avenues, and Harbor road. The thoroughfares to be closed are Douglas street and Newark avenue, both at the extreme east end of the work.

In effecting the separation of grades at the crossings named, all of the thoroughfares, except one, are being raised in conjunction with the depression of the tracks, the amount of raise varying from as little as 1 ft. near the center of the project, to 10½ ft. at the extreme ends. All of the bridges being constructed are of the I-beam type with reinforced concrete decks and end supports, and with earth embankment approaches. In addition to these structures, pedestrian bridges are being constructed at Newark avenue and at Erastina place.

Fort Wadsworth Project

In the Fort Wadsworth project on the South Beach line, the two tracks of the railway are being depressed in their present location from about Belair road station to approximately 2,000 ft. south of Fort Wadsworth station, a total distance of 3,300 ft., and three grade

crossings are being eliminated. Belair road will be closed, except for a pedestrian subway which is being provided; new bridges will carry Hope, Tompkins, Chestnut and St. Marys avenues over the tracks; an existing bridge carrying Fingerboard road has been completely rebuilt in harmony with the other bridges; and the grade crossings at Lynhurst and Cedar avenues will be closed. At the two last named crossings, new lateral streets will provide an outlet, and foot bridges for pedestrians will be constructed over the tracks. For the extent of the Fort Wadsworth project, a single detour track along the west side of the right-of-way is carrying all traffic through the construction period, amounting to approximately 165 trains daily.

The magnitude of the present program of grade separation on Staten Island is evidenced not alone in its total cost of approximately $6,000,000 and the scope of the work as outlined in the foregoing, but also in the number of structures being built and the quantities of materials being handled or used. Together, the four projects involve 5,442 lin. ft. of reinforced concrete viaduct, 17 street bridges, 14 railway bridges, 6 foot bridges or pedestrian subways, approximately 500,000 cu. yd. of excavation and fill in cuts or embankments, and approximately 54,000 cu. yd. of concrete.

In addition, the projects include extensive changes and additions to sewer and water lines at most of the streets crossed, particularly in the areas of track depression, and the construction, relocation or rearrangement of many miles of high-tension transmission, communication, supervisory control and signal lines, both overhead and in underground ducts. Other work involved includes many street changes, the provision of temporary passenger station facilities at seven stations and the construction of new passenger stations at eight points in conformity with the track changes, and the revision of facilities in connection with numerous freighthouses, team tracks and industrial sidings.

No Interference With Train Operation

In carrying out this extensive grade separation work, all construction details and operations are predicated on complete avoidance of train interferences or delays, a condition which has been met with an almost perfect record in spite of the numerous problems and difficulties which it has presented to the construction forces. Practically every passenger train movement on the railway is co-ordinated with the ferry boat schedules at either St. George or Tottenville, and even minor delays would be likely to upset or disrupt operations for a considerable period, with possible inconvenience to thousands of passengers.

All of the work on Staten Island has been planned and and is being carried out under the general direction of H. A. Lane, chief engineer of the Baltimore & Ohio, with E. L. Gosnell, principal assistant engineer in general charge of work in the field and of negotiations with public authorities. The design and construction of bridges is under the supervision of P. G. Lang, Jr., engineer of bridges, while L. P. Kimball, engineer of buildings is in charge of all building work. J. G. Teders, assistant engineer, was in direct charge of all construction in the field until his death in June, 1936, when he was succeeded by W. N. Young. Resident engineers on the work are H. L. Scribner, D. W. Tilman, A. Mitchell, Jr. and P. C. Sparks.

The Transit Commission is represented in the field by a corps of inspectors under the direction of W. L. Selmer, chief, Division of Railroad Engineering, while the Public Works Administration has a similar organization under William Mueser, chief resident engineer-inspector. The interests of the City of New York are taken care of by C. K. Conard, representing the Board of Estimate & Apportionment, and H. W. Ordeman, consulting engineer, represents the Borough of Richmond.

The general contractors on the four projects are the Arundel Corporation, Baltimore, Md., which is carrying out the Elm Park—Mariners Harbor work; the P. T. Cox Contracting Company, New York, on the Port Richmond—Tower Hill project; the Faircroft Engineering Corporation, Brooklyn, N. Y., which has the Stapleton work including Jersey street; and the Bates & Rogers Construction Company, Chicago, which has part of the Fort Wadsworth project, with the Vanbro Construction Company, Staten Island, doing the remainder.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended November 28 totaled 679,984 cars, an increase of 108,106 cars or 18.9 per cent compared with the corresponding week in 1935, but a decrease of 107,088 cars or 13.6 per cent below the corresponding week in 1930, which did not contain a holiday. Due to the Thanksgiving holiday, this was a reduction of 109,516 cars or 13.9 per cent below the preceding week. All commodity classifications showed decreases over the preceding week, but increases over the same week last year. The summary as compiled by the Car Service Division of the Association of American Railroads follows:

Revenue Freight Car Loading

For Week Ended Saturday, November 28

Districts	1936	1935	1934
Eastern	145,682	127,703	105,299
Allegheny	138,517	112,147	93,147
Pocahontas	52,846	39,932	33,164
Southern	102,346	83,791	75,804
Northwestern	78,016	66,953	57,838
Central Western	104,365	89,686	76,521
Southwestern	58,212	51,666	46,412
Total Western Districts	240,593	208,305	180,771
Total All Roads	679,984	571,878	488,185
Commodities			
Grain and Grain Products	30,975	30,154	23,781
Live Stock	15,944	13,028	15,873
Coal	151,545	120,276	103,597
Coke	11,209	7,777	4,467
Forest Products	32,587	25,955	18,668
Ore	13,369	8,811	3,579
Merchandise L.C.L.	145,538	137,640	136,769
Miscellaneous	278,817	228,237	181,451
November 28	679,984	571,878	488,185
November 21	789,500	647,924	561,942
November 14	784,672	629,728	585,034
November 7	759,318	654,947	594,790
October 31	814,175	681,998	613,048
Cumulative Total, 48 Weeks	33,287,689	29,181,612	28,740,391

Car Loading in Canada

Car loadings in Canada for the week ended November 28 totaled 49,586, as compared to 46,815 last year and 51,521 in the week preceding, according to the weekly report of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
November 28, 1936	49,586	25,751
November 21, 1936	51,521	28,094
November 14, 1936	53,606	26,631
November 30, 1935	46,815	21,508
Cumulative Totals for Canada:		
November 28, 1936	2,294,212	1,126,396
November 30, 1935	2,191,645	1,024,121
December 1, 1934	2,162,817	1,022,310

Means Used to Boost Efficiency

A review of measures introduced by the railroads in the last few years to improve and lessen cost of their operations

By L. A. Downs
President, Illinois Central System, Chicago

MANY people have seen and admired one or more of the 20-odd streamline trains that are now in operation on a dozen American railroads. Many of them also have experienced the luxury of a ride in one of the 7,000 air-conditioned cars that were in operation on American passenger trains this past summer. But relatively few people outside railway circles have any occasion to know how greatly mass production methods on the railroads have been modernized in recent years.

A Huge Job of Dollar Stretching

For many years prior to 1929 the railroads of the United States had operated on a small margin of so-called profit, and railway men had some experience in stretching dollars to make them go as far as seemed possible. However, the experience that had been gained in stretching dollars prior to 1929 was no adequate preparation for the terrific economies that had to be made to meet the unprecedented decline in traffic and revenues which followed. By 1933 the railroads had been set back some 20 years in amount of annual revenue, some 30 years in volume of traffic. They had twentieth century needs and a nineteenth century income.

Drastic reductions had to be made in operating expenses and they had to be made without impairing the service; in fact, while the expenses were being reduced, the service had to be improved to hold the business that was left and to win more business. It was an experience that our generation of railway men will never forget. They had to revise the standards that had been built up over the years by painstaking effort and get down to elementals. It was a job of re-education that required a lot of new thinking and hard work.

How the situation was met is now a matter of record. Those who are acquainted with financial affairs know how greatly expenses were reduced. However, I doubt if many people other than railway men appreciate how much the refinement of mass production methods contributed to the result.

In the six years from 1930 to 1935, inclusive, compared with 1929, the Class I railroads made an aggregate reduction in expenses amounting to $10,194,000,000. In some part this reduction represents work that was put off because it could be put off without injury to the service.

We were able thus to borrow on the future to this extent, but such work will have to be done, as indeed some of it has already been done since 1933. Other reductions were made because there was less business on the railroads, requiring fewer train-miles and less work on the tracks and in shops, yards and offices, making it possible to close stations, abandon trackage, etc. Some part of these reductions will become permanent economies, but most of them have been disappearing in the last three years and will continue to disappear as business increases.

However, there were still other reductions in expenses that were made possible by the development and increased use of new and improved materials, modern tools and better methods and by fundamental changes in the art. These are mostly permanent economies.

Many of these permanent economies originated on the railroads; others were developed by the makers of the machines, tools and other materials and supplies that are produced for the railway market; still others were borrowed from other industries and adapted to our uses.

In describing the permanent economies that have been made by the use of modern methods of mass production, we might well start with the track, which is the basic part of the railway plant. Here we find an almost endless array of improvements that were developed or came into wider use during the depression years to improve the track structure and to reduce the cost of its maintenance.

Notable improvements have been made in the manufacture of rails to make them harder and increase their service life. Most rail damage occurs at the joints, which are battered down under traffic. We formerly took up the rails when they became worn at the ends, sawed off the worn ends and relaid them in secondary tracks. This entailed the expense of removal and relaying and, of course, increased the number of joints. Now we build up the ends of worn rails by the welding process, which prolongs the life of the rail fully one-third. Machines are used which generate their own power and can be moved from point to point along the track, making it possible to do this work without taking the rail out of the track and indeed under the heaviest traffic. In the five years from 1931 to 1935, we built up the ends of some 5,000 miles of rails on the Illinois Central by the welding process.

The same process is used on frogs and switch points, which were formerly scrapped when they became worn

Mr. Downs "Looks at the Record"

Speaking before the twenty-fifth annual convention of the Investment Bankers Association of America at Augusta, Ga., on December 3, Mr. Downs directed the attention of this influential body to the methods of mass-production which the railways have developed and employed during the last few years of depression in their struggle to maintain and improve their service in the face of drastic declines in revenues. Using specific figures from Illinois Central practices, he reveals the progress which the railways have made in reducing costs and increasing output in many directions. Mr. Downs presented the record —one in which every railway man may take pride.

but which are now virtually renewed by the welding process.

Fully 50 per cent of the expense of track maintenance is incurred at the rail joints. The same stresses which cause the rail to wear at the ends also cause the fastenings to work loose and the ballast to be disturbed. Anything that is done to lessen the number of joints makes for permanent economy in track maintenance and produces a collateral saving by reducing the shocks on the equipment. One thing that has been done has been to lengthen the standard rail from 33 to 39 ft., reducing the number of joints in the track by 18 per cent. Another thing that has been done has been to weld into a single piece long stretches of rail in crossings, on bridges, in tunnels and elsewhere. This has been done experimentally on stretches up to one mile in length, with such success as to hold promise of additional permanent economies in the future.

The treatment of ties and bridge timbers has produced large permanent economies. Treatment just about trebles the service life of such material—from 10 to 30 years in the case of bridge timbers, from 6 to 8 to 20 years in the case of ties. Treatment of ties and timbers began some years ago and has progressed as renewals have been made, and the full effect of this modernization has come to be realized only in recent years.

Machines Cut Costs

There was a time when practically all work that was done on the track was hand labor. The pick and shovel were the recognized symbols of the craft, and the trackman truly earned his bread by the sweat of his brow. First came steam shovels, then pile drivers, to do some of the heaviest track work. Then other machines were developed, primarily in response to the demand of the men in charge of roadway maintenance on the railroads, and their numbers and use have been gradually extended until practically all track work has been mechanized.

Laying rail is now a mechanical operation. Spikes are pulled by machine, the old rail is taken out of the track by machine, grooves for tieplates are cut in the new ties by machine, the new rail is put in place by machine, and the bolts are tightened and the spikes are driven by machine. With these modern methods it is possible to lay rail with about one-fourth of the number of men that were formerly required, and the cost has been reduced to about one-third of what it was.

Track surfacing also is mechanized. Machines are used to loosen the ballast, other machines are used to clean and renovate it, and still other machines are employed to tamp it back into place. It is possible to turn out 50 per cent more work per man-hour in this fashion, and it is uniformly better work. Machines also are used for burning weeds, mowing right of way, grading shoulders and ditching and banking.

One of the most expensive jobs in roadway maintenance in the past was to keep switches in working order in blizzard weather. On a busy terminal it took two men to every switch stand. The work was difficult, accidents were numerous, and there were many delays to trains. On busy terminals oil and electric heaters are now used at switches which melt the snow as it falls, and elsewhere blow torches are used to keep switch points clear. With these improved methods it takes a handful of men to do the work that once required a small army, and the change has reduced accidents and avoided train delays with additional savings.

The improvement in the track structure that has been brought about by better materials and better tools has also made it possible to effect permanent economies in the expense of supervision. The old track structure required constant attention; it took a section foreman and a gang of men working long hours to keep up even a small section of track. With the present track structure and the improved tools that are available, it is now possible for a section foreman to cover twice as much territory as formerly, do it with fewer men and do it more thoroughly and more efficiently. On the Illinois Central the number of track sections has been reduced from 1,322 to 680, and the supervision is better than it was before.

Equipment Maintenance Systematized

Much the same story can be told in regard to the maintenance of equipment. At one time it was the accepted practice to repair locomotives and cars at many scattered points over the railroad, each shop taking care of the locomotives and cars that happened to need repairs, as a roadside garage repairs the automobiles that turn up needing repairs. The hammer and wrench were the symbols of the repairman's craft, as the pick and shovel were the symbols of the trackman's craft.

All that is changed now. Freight car repairs are concentrated in few shops, each shop fully equipped with the latest machinery and tools for doing the work speedily, economically and efficiently. Cars of the same series—that is, of identical construction—are repaired at the same time. As the cars are moved along the repair line, an adaptation of the automobile assembly line, they are stripped, worn and broken parts are removed or built up, replacements are made, and the cars come off the line entirely renewed except for the paint job. The painting is then done with spray guns. These modern methods of mass production save approximately 30 per cent in labor expense, and there are also important collateral savings, not the least of which is the saving in time, for idle cars represent idle investment; in modern practice idle time in shops is reduced to a fraction of what it once was.

Similar methods are used in repairing locomotives. Repairs are concentrated at shops where the volume of work permits of having the newest machines and tools that do away almost entirely with the old hand methods. The locomotives are stripped; the parts to be repaired or renewed do not touch the ground but are placed on skids and taken to the various parts of the shop where repairs are made; new or renewed parts are assembled in proper order and applied with power tools; and the locomotive comes out ready for service, even sturdier than the day it came off the builder's assembly line.

Reclamation Effects Large Economies

Reclamation is one of the most remarkable modern developments in shop practice. It was formerly necessary to scrap practically all worn and defective parts of cars and locomotives. Then welding was developed for iron and steel parts and later was extended to use alloys to match any parent metal. By renewing worn parts instead of buying new ones we save an average of $19.50 apiece on couplers, and we renew some 30,000 of them a year; we save $26.50 apiece on side frames, and we renew some 6000 of them a year; we save $39 apiece on truck bolsters, and we renew some 3000 of them a year. These are merely a few illustrations; some 500 different parts of cars and locomotives are repaired or renewed by the welding process. Also in dismantling cars and locomotives, parts which formerly went to the scrap heap are now reclaimed and sent to the storehouse to be used instead of new parts.

Improved methods of water treatment and the regular blowing off of boilers on the road and at terminals remove the impurities and prevent scale and corrosion,

and so extend the life of boilers, flues, fireboxes, staybolts and other parts. The service life of flues has been doubled—from 6 to 12 years, on the average—by these methods. The average service life of fireboxes has been lengthened six years or more. Before 1929 we had to rebuild 115 fireboxes a year; since then we have averaged 15 a year.

Permanent economies also have been realized in the handling of shop materials. On the Illinois Central we have more than doubled the number of power-driven machines for handling material in the shops.

Locomotives Modernized

There have also been numerous improvements in the locomotives themselves. The newest locomotive is based on the same principle as Stephenson's "Rocket," just as the newest automobile or airplane motor is based on the same principle as the first one that was ever made. However, there have been as great changes in locomotives as in automobile or airplane motors for those with eyes to see. Some of the recent improvements applied to locomotives when they go through the shops have been to increase the boiler pressure, install automatic stokers, improve the lubrication, use alloy metals to reduce weight and increase strength, and increase the coal and water capacities. By such improvements tractive effort has been increased, and it has been possible to use the rebuilt locomotives in place of heavier power, with permanent economies in both operation and maintenance.

The modern locomotive is such a sturdy, dependable machine that it is no longer necessary to change engines every 100 miles and send them to the shop to be inspected and adjusted. Instead engine runs have been extended to as much as 1000 miles, with fewer engine failures than when they were relieved every 100 miles. As an example, we formerly used seven engines to haul our passenger trains between Chicago and New Orleans, La.; we now use only two. The extension of engine runs in freight and passenger service has made for permanent economies in maintenance, and it has made possible the closing of many mechanical terminals, with consequent reduction in handling expense.

It used to be considered necessary to divide the railroad into compact divisions for operation, each with a full staff of operating officers, supervisors and office workers. On the Illinois Central we formerly had 20 operating divisions, and the division officers had their hands full in running their divisions and getting the trains over the road. All that is changed now. With better track, better power, better tools and better methods it is possible for a division superintendent and his staff to cover more territory and do a better job. Since it is no longer necessary for the division officers to spend most of their time unsnarling tangles, they can devote themselves to economy of operation, and that can be done better with larger territories. On the Illinois Central we have reduced our operating divisions from 20 to 10, with a corresponding reduction in staff officers and supervisors and office attendants and with permanent economies in expenses.

Until recently it was the accepted practice for each division to do all of its own timekeeping and other accounting work. The same was true in all the different shops and storehouses on the railroad and at the principal stations. Under the urge to economize, we found that we could make intensive use of modern machines by concentration of the work. We, therefore, did away with separate divisional, shop, storehouse and station accounting, concentrating the work in offices where the volume made it possible to use these modern methods. The change was made without depriving the officers in immediate charge of any essential information; in fact, they get this necessary information more frequently and in better shape than they did before.

These developments in mass production are some of the reasons why it has been possible for the railroads to make a continuing reduction in the unit cost of railway operation in the face of decreased volume of traffic. In 1921 the operating cost of moving a ton of freight a thousand miles was $10.78. In 1929 it was $7.44. With the decline in volume since 1929 it might be expected that the unit cost would increase, but instead of that it was further reduced to $6.63 in 1935. Considering the permanent economies which will continue into the future, the unit cost will certainly be reduced still further with increased volume.

Searching for Still More Improvements

It is needless to say that opportunities for permanent economies on the railroad have not been exhausted. Research is going on all the time. To illustrate: Draft gears and couplings are under test in the railroad laboratory at Purdue university. Rails are being tested in the laboratory sustained by the railroads at the University of Illinois. Rails are also being tested in the track by the use of detector cars which locate hidden fissures within the rail. Air-conditioning is being studied co-operatively by the railroads to determine how it may be improved. Each railroad also has its own research program, going into all manner of materials and practices. These efforts are supplemented by the research activities that are constantly being conducted by the manufacturers of the tools and materials which the railroads use in such large quantities. And it should also be said that not all research work is done in laboratories. Every railway man who goes about his job with an alert and questioning mind is, in the best sense, a research worker, seeking new ways to improve the service and cheapen the cost of producing it. New materials, new tools and new methods are being developed all the time.

The railroads are coming out of the depression with a new reputation. Up and down and across the country their service improvements are being acclaimed as the achievements of an alert, progressive industry. The newest figure of American speech—"as modern as a streamliner"—pays glowing tribute to the vigor and vitality which they have demonstrated under the terrific stress of the hardest times they have experienced in a century of being. They have come forward in service, they have come forward in their methods of maintenance and operation, and they have come forward in public prestige and popular esteem. I submit the record for your judgment.

* * *

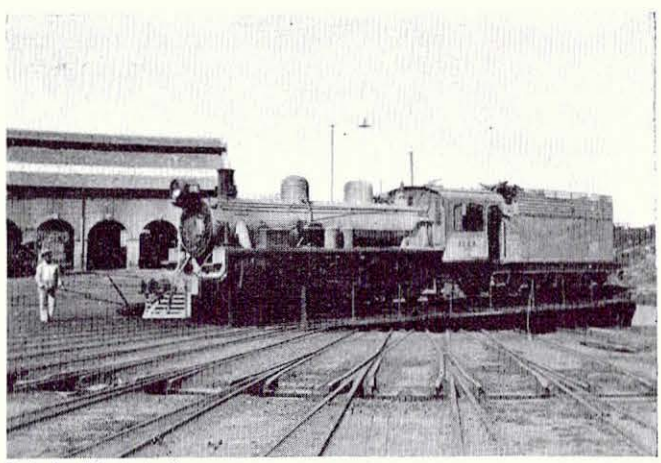


Photo by Robert A. Carr
An Alco Locomotive in Argentina on the Province of Santa Fe Railway

Symposium on Feedwater Heating

Five manufacturers' representatives describe economies effected with different types of locomotive feedwater heaters

AT the regular monthly meeting of the Western Railway Club, held Monday evening, November 16, at the Hotel Sherman, Chicago, the subject of locomotive feedwater heating was discussed in most of its important phases by the representatives of five different manufacturers of feedwater heating equipment.

The introductory paper by R. M. Ostermann, Superheater Company, was devoted to a general discussion of the advantages and possibilities of feedwater heating, emphasizing the increase in boiler capacity and horsepower output which can be obtained at relatively small expense. R. K. Smith, J. S. Coffin, Jr., Company, stressed the necessity for guaranteed performance of locomotive auxiliaries, including the feedwater heater. W. J. Hall, Consolidated Ashcroft Hancock Company, Inc., described a new 4-stage turbo-injector feedwater heating system, which is, in effect, an open system, utilizing a combination of nozzles and tubes to mix the exhaust steam with the cold water. T. C. McBride, Worthington Pump & Machinery Corp., said that railroad men have a right to expect continuous maximum performance from feedwater heaters and that the high percentage of new locomotives equipped with feedwater heaters is convincing evidence of the progressive attitude of railway managements toward locomotive efficiency-increasing devices. L. F. Wilson, Wilson Engineering Corporation, emphasized primarily service availability and the economic advantages of a feedwater heater which recovers the maximum number of heat units from the exhaust steam and delivers heated water to the boiler at any time, regardless of whether the locomotive is working, drifting, or standing.

Abstracts of the prepared discussions are given below.

Importance of Feedwater Heating

By R. M. Ostermann*

Progress in locomotive design is, in the last analysis, desired for reduction of transportation and mechanical department expenses, or, it may be more generally stated, in order to increase the railroad's net revenues. Any innovation which is fundamental enough to increase the thermal efficiency of the locomotive's steam cycle must also increase its maximum potential horsepower development, enabling the railroads to produce through its adoption more ton-miles per hour. Unfortunately, operating statistics are not always prepared on the ton-mile per hour or passenger car-mile per hour basis. Locomotive movements are generally analyzed on the mile basis. The same is true of fuel consumption and maintenance expense. At the same time, fuel consumption, and probably also to a certain extent maintenance expense, is actually governed by power output which is measurable only in horsepower, ton-miles per hour or passenger car-miles per hour. In other words, the speed element enters into these relations, and that must have become very evident to all railroad operators since they began to speed up their trains. Nowadays even school children operate automobiles with power plants in them and learn by inescapable experience that if they run their cars at 60 miles an hour they make less miles per gallon of gas than when they run them at a lower speed. Every man, woman and child can thus readily obtain evidence of the influence which the load on the power plant has upon its thermal efficiency.

In the same manner, when a locomotive hauls a train for a given weight over a division in 2 hr. 45 min., whereas another locomotive takes 3 hr. for the same haul, the first-mentioned locomotive does about 10 per cent more work per hour than the last-mentioned one, i.e., it delivers about 10 per cent more horsepower. If the fuel rate per drawbar horsepower-hour remained unchanged with this increase of horsepower development, the fuel rate per locomotive-mile would be unchanged, and fuel performance statistics on the locomotive-mile basis would then quite satisfactorily portray the relative state of maintenance of the two locomotives in question. But the fuel rate per drawbar horsepower-hour does not remain constant with a 10 per cent increase of horsepower; it increases perceptibly, and very much so, if the slower haul was made by an underboilered locomotive. This then means that the faster haul will consume more coal per locomotive-mile than the slower haul, and that is not because of a poorer mechanical condition of the faster locomotive but because of the rate at which it was worked.

Why coal rates increase and efficiencies sometimes rapidly drop with overloads is well known. There are certain maximum combustion rates and heat absorption rates which cannot be exceeded without excessive loss of economy; and a 100 per cent boiler, by definition, is one that has a grate, furnace and heating surface large enough so that the steam demanded by the cylinders can be generated with a fair efficiency by the draft which the available cylinder exhaust will create. Furthermore, if the duty of an engine with a 100 per cent or near 100 per cent boiler is unduly increased, it may have to be accompanied by an increase of the steam rate per drawbar horsepower-hour resulting from higher speed, longer cutoff, higher back pressure, which, again, throws a relatively higher steam demand upon an already overworked boiler.

These are the conditions which many railroads faced when they had to speed up their train operations substantially with existing power. They did it with a substantial sacrifice of fuel economy.

Feedwater Heating Effects Increase in Thermal Efficiency

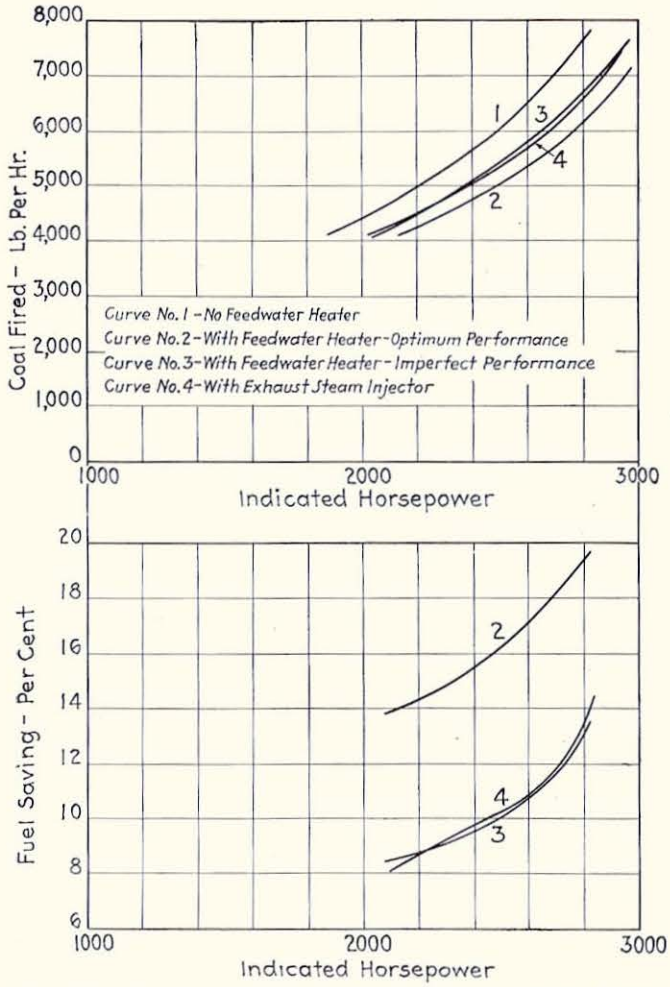
Feedwater heating, then, which is a relatively inexpensive means of adding to the evaporating capacity of a locomotive boiler, should not be, as such, condemned or even lightly considered. In fact, next to providing the maximum superheat with which engines can still be lubricated, it constitutes the largest single thermal improvement which can be effected on a conventional steam locomotive. Given a properly proportioned and properly maintained feedwater heating device, up to about one-sixth to one-seventh of the available engine exhaust can be condensed by the cold feedwater, and its heat re-

* Superheater Company, Chicago.

turned to the boiler instead of being wasted through the stack.

What does this mean in terms of fuel saving or horsepower increase? In one of the charts the upper field shows various curves denoting the relation between pounds of coal fired per hour and the indicated horsepower; the lower field contains curves of net fuel saving obtainable at the various horsepower outputs. Turning to the upper field where one curve is shown for a locomotive without feedwater heating device, one for the optimum feedwater heating effect, and one for an imperfect feedwater heating effect, a horizontal line drawn through any of the hourly coal consumption figures, and extending it to the intersection with the various curves, locates points on the indicated horsepower scale. These points indicate the gain in horsepower development that is possible by perfect and less than perfect feed-water heating.

Similarly, in the lower field the net fuel savings are shown for optimum and less than optimum feedwater heating at various horsepower outputs. The optimum curves were calculated for locomotives of 250-lb. boiler pressure, with boilers having an efficiency range of about 80-60 per cent from light to maximum evaporation, using 5 per cent of their steam for auxiliaries exclusive of boiler feed pumps and for 60 deg. F. suction water temperature. The optimum performance was assumed to be obtained when a preheating temperature of within 10 deg. of the condensing temperature in the heater was obtained, with a 2½ per cent live steam consumption for the pumping means such as is obtained on properly proportioned clean closed heaters with a reciprocating pump in good condition, and being operated on saturated steam. With superheated steam, the pump steam consumption can be decreased to 1½ per cent, i.e., one per cent greater net saving can be obtained. The less than optimum curve was figured on the same basis but with a temperature difference of 60 deg. between the branch pipe water and the condensing temperature of the heater, indicating a heavily incrusted heater or a defective pump or both combined.* Other types of heaters may also deviate from the optimum performance to a larger or smaller degree, depending upon many factors in their maintenance. Improper venting of open heaters, undue pressure drop in exhaust steam pipes, loss of volumetric efficiency of reciprocating pumps, or undue leakage loss of centrifugal pumps with consequently high steam consumption of the pumping means, may very well upset the optimum possibilities. It goes without saying that all heaters, everything else being alike, condense more steam and show a greater percentage effect in winter when the tender water is cold than in summer.



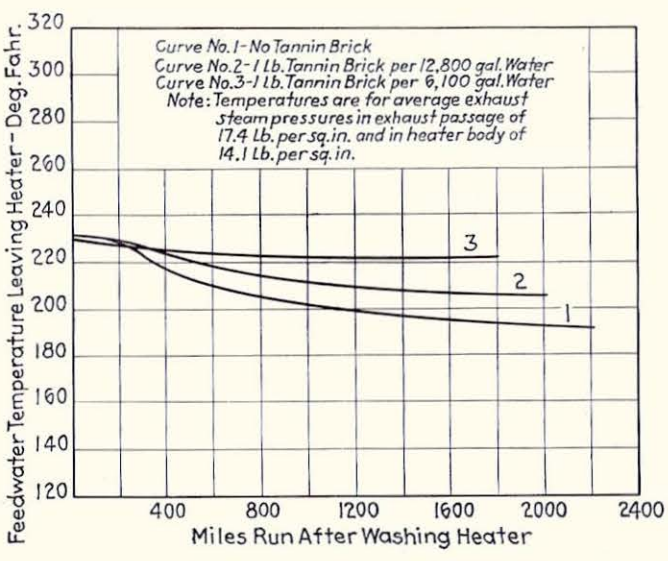
Horsepower Increase and Fuel Saving Due to Feedwater Heating Devices

In spite of the uncertainty of the element of maintenance which enters rather strongly into the picture, and that refers particularly to the efficiency of the pumping means, because the gross heat saving must always be debited with the pump steam consumption before the net heat saving can be established—the curves are interesting enough. They give a general idea of the magnitude of the savings involved. They allow to figure roughly the return upon the investment with a known fuel cost of the non-feedwater heater locomotive, should a feedwater heating device be applied to it. They allow also to consider the possible fuel savings in dollars in relation to the probable maintenance costs of the feedwater heating device.

Substantial Savings Even With Inadequate Maintenance

It will be observed that the percentages of improvement are substantial enough even admitting possible shortcomings in maintenance. Assume, if you please, a locomotive burning $10,000 worth of fuel a year, which is conservative as fair sized locomotives are operated today, and a fuel saving of 10 per cent—in accordance with these curves. The net fuel saving of $1,000, diminished by a 10 per cent depreciation and interest charge

* One of the charts shows actual results achieved on an important western road in reducing scale incrustation in closed heaters by the introduction, at small cost, of tannin briquets in varying amounts in the locomotive feedwater.



Effect of Tannin on Performance of Closed Heaters

on a $2,500 investment, the probable cost of such an installation, still leaves $750 a year before maintenance. I dare say that many feedwater heating devices don't cost one-third of this amount for their maintenance, even with unfavorable water conditions. It is believed that the selection of the conservative figure of 10 per cent for the fuel saving gives due appreciation to the fact—which must never be overlooked—that on many railroads locomotives are not developing their maximum power in every mile of their run, and do not always develop back pressures most favorable to obtaining the highest preheating temperatures; also that heaters are not always correctly operated in that water is pumped through the heater faster than should be done in view of prevailing back pressures and evaporation requirements. Heaters, pumps and piping are not always so proportioned that, at low back pressures, the amount of exhaust steam flow is induced which would be necessary to heat unusually large amounts of water at low back pressures. There is a very definite fixed relation between back pressure and evaporation on every class of locomotive, which varies with the efficiency of the draft-making apparatus. Heaters, pumps and piping should always be so designed in their relative capacity that the back pressure corresponding to a certain evaporation of water produces the correct exhaust steam flow to the heater to heat that quantity of water to the optimum, but it is not humanly possible to obtain that result whenever a quantity of water is pumped that substantially exceeds the one corresponding to the prevailing back pressure. With no feedwater heaters with which I am familiar is there a provision which would insure proportionality between exhaust steam flow and water pumped, and which would prevent overloading the heaters temporarily with a resulting decrease of optimum feedwater heating effect.

The nearest approach to such an arrangment is to be found in a recently developed Elesco exhaust steam injector in which the exhaust steam flow is automatically apportioned to the water pumped by the injector. This automatic device was primarily introduced for the purpose of stabilizing the pumping power of the injector but, to a certain extent, it acts also as a stabilizer of the feedwater heating effect. It is fortunate, for the average sustained economy of feedwater heating devices, that the firemen know that best results are had by maintaining a fixed water level, and to pump at all times only the amount of water which is being evaporated; they then work to the most favorable feedwater heating condition, as far as possible, by themselves.

I have added to the chart two curves, one in each field, which are representative of the net fuel saving and horsepower increase that are obtainable with Elesco's latest injector heater, no matter what the fireman or engineer does, in that it is fully automatic. You will note that the same optimum feedwater heating effects that are obtainable with pump feedwater heaters cannot be secured with exhaust steam injectors as developed so far, but considering their lesser first cost and lesser maintenance cost per year, they can, I believe, in many instances, compete with pump heaters on all-over economic grounds. This is particularly true where the maintenance efforts in connection with feedwater heaters are not effective enough to allow the performance to coincide with the optimum one at all times. It is to be remembered that exhaust steam injectors, like live steam injectors, imperatively demand a fair condition of their most important nozzles, as otherwise they will not work properly, but as long as the nozzles are kept in fair shape, the maximum possible exhaust steam condensation is maintained with a full automatic injector, i.e., one in which the exhaust steam is not regulable by hand. Feedwater heaters can work for weeks with a poor state of maintenance and net heat savings far below the possible maximum.

Water Saving Also Important Factor

Among the advantages to be derived from feedwater heating, the water saving has not been mentioned. Because one-sixth to one-seventh of the exhaust steam is condensed and fed back to the boiler, the water consumption per horsepower-hour is similarly decreased. This in itself may provide a very tangible operating advantage because more horsepower-hours can be produced with a given tender capacity; and for the same horsepower, the locomotive can run longer between water stops. Based upon a 15 per cent water saving, the actual increase of equivalent tender capacity amounts to about 18 per cent.

It is also interesting to consider, for a moment, the horsepower increase which can be obtained from feedwater heating in relation to the weight added by the feedwater heating device. Open or closed heaters with pumps will add from about 3,000 to 5,000 lb. to the weight, exhaust steam injectors about 1,000 lb. Does anyone present here believe that if he increases the weight of a locomotive boiler proper by such amounts he can obtain a 10 to 15 per cent greater boiler capacity without sacrificing efficiency?

Furthermore, does anyone here believe that he can purchase a similar increase of boiler capacity in a larger boiler for what a feedwater heater installation costs him? You can actually buy the equivalent additional boiler horsepower with an exhaust steam injector at $4 to $6 per hp. by installing pump feedwater heaters at $6 to $9 per hp. Even if axle loads allowed the necessary weight increase of the boiler, you would save money by providing the required additional capacity with a feedwater heating device.

I desire to caution you against wrong deductions. Don't check the curves illustrated against your fuel records kept on a locomotive-miles basis, but by properly conducted tests of one and the same locomotive, operated one time with the feedwater heating device, the other time when fed with the live steam injector. Use a dynamometer car or some other means to determine accurately the coal per horsepower-hour. It is the only correct yardstick. Please remember also that when you place an economy device on a locomotive, the engineman is liable to use it as a capacity-increasing device to produce more horsepower-hours, but with the same amount of fuel and water as before the application of the device.

Guaranteed Feedwater Heater Performance

By R. K. Smith*

Due to the increasing necessity for economy in locomotive operation, it becomes more and more urgent to scrutinize every element which contributes to the design of a locomotive. In this respect, locomotive operation is beginning to be thought of in comparable terms to power plant operation. Great progress has been made in steam generation in locomotive boilers. Steam distribution and utilization has also been greatly improved and great strides in addition have been made in increased draft efficiency. In short, the basic locomotive of to-day has undergone remarkable improvements during the last ten years, from a performance standpoint.

Accounting for by far the greater portion of the great-

* J. S. Coffin, Jr., Co., Joliet, Ill.

ly improved economy of the modern locomotive are the auxiliaries. Generally speaking, locomotive designers have concentrated on the basic locomotive, depending largely upon information supplied by manufacturers as to performance characteristics of those vital elements, namely the auxiliaries, which play the dominating part in the ultimate result.

Using again the analogy of power plant practice, no competent designer would even think of specifying auxiliaries, or incorporating them into plant design without complete facts at his disposal, realizing that a high overall efficiency is absolutely dependent upon an aggregation of relatively small savings. It is the usual procedure in power plant practice to specify all important auxiliary apparatus under strict guarantees and base the plant design upon facts backed up by definite responsibility on the part of the manufacturer.

Present day conditions will soon compel similar methods in locomotive practice. It is an indisputable fact, that if locomotive auxiliaries are specified to guaranteed performance, and if best possible results are insisted upon, great further strides will be made in locomotive efficiency at no extra cost.

Taking up specifically the question of feedwater heaters, it will be argued that due to the many operating variables encountered in road service, it is impossible to predict accurately what may be expected of any particular system. It should be pointed out that there are three things that the designer and operating official must know in order to intelligently specify feedwater heater equipment with due regard to cost of the equipment and the best results available:

First, what guaranteed test ratings are met by each system under duly witnessed laboratory conditions and under approved test codes?

Second, what correction factors should be applied to reduce these to road conditions?

Third, what are the relative costs and how should these costs be evaluated with respect to the above?

The first item should be used as the main basis of comparison and should leave no doubt whatever as to the potential performance of each system, provided that the tests in all cases are made under rigid scrutiny of the customer and under competently approved test codes. Since service variables are neglected in these tests, the data should be used for design purposes, only when proper service corrections have been applied. The value of this kind of information is that it is specific and leaves no room for doubt or dispute. It is the only tangible data upon which guarantees can be based, and should be of great assistance to the designer, operating man, and supplier alike. By thus placing a premium on performance the manufacturer is stimulated to his best efforts and startling economies will definitely result.

The second item, having to do with correction factors is a matter involving experience, careful analysis of road tests and empirical data, which if intelligently applied will come surprisingly close to actual conditions. For example, pump steam consumption and capacity is a function of steam quality and should be corrected for both average and extreme conditions, as it may affect the results materially. Mechanical wear in centrifugal pumps can be corrected for very accurately. Pressure and suction heads and suction temperatures call for careful corrections as well as pump back pressure. In short, the entire heater system is subject to close correction for each class of service and design of engine. Time does not permit of more detailed discussion of this subject, the purpose being merely to show the scientific method of approach. Published statements of heater performance vary as much as plus or minus 50 per cent of the facts, and there is no real reason for it.

The third item, having to do with costs is, of course, vital and involves first the applied costs which can be reduced closely to facts. Again, the operating costs, which can be factual if based upon the user's own records and checked against similar data from other roads.

With these three classes of definite information at his disposal, the purchaser can make an intelligent economic evaluation of all available systems.

Without this information, there is no accurate means of predicting whether or not the results with any particular system will be way over or way under the facts and, therefore, it appears vitally necessary to specify any kind of feedwater heating equipment on a basis of definite guarantees.

Service Availability Of Feedwater Heaters

By L. F. Wilson*

In steam engineering design, whether marine, stationary, or locomotive in nature, availability of all equipment for constant service is customarily a matter for first consideration. In the design of feedwater heating equipment, those responsible for the economical operation of steamships or of stationery plants would look askance at any plan which might not include complete compliance with this requirement.

A feedwater heater, to justify its use, must depend upon the recovery of the otherwise wasted heat units of the exhaust steam. But since there are many requirements upon the locomotive boiler for steam other than supplying the main cylinders, the only way possible to make constant the replacement of evaporated water is to store the necessary recovered exhaust steam heat units while the locomotive is working steam, for use in heating the feedwater required while the locomotive is not working steam through the main cylinders.

In certain classes of road service, it is well known to all of us that the use of steam from the locomotive boiler does not cease when the throttle is closed. We require steam in passenger service for air conditioning, train heating, train lighting, and air compression. In freight service we require steam, under similar conditions, for air compression, locomotive lighting, and in some cases refrigeration.

It has been variously estimated that the earlier conventional types of feedwater heaters are available only for 60 to 80 per cent of the boiler requirements in feedwater. In switch service, it is probable that more than 50 per cent of the boiler feedwater is delivered while the locomotive is not working steam through the main cylinders.

Of course, the live steam injector is always available to make up deficiencies, but if there is to be an investment of some $1,500 to $3,000 more or less, for feedwater heating equipment of a locomotive to save, by the recovery of exhaust steam heat a percentage of 10 to 12 per cent measured in fuel, we must face the obvious fact that to obtain this overall economy the feedwater heater must be constantly available.

In locomotive operation, since the primary mover in itself is an intermittently operated machine, there has been from the beginning, in the history of the development of feedwater heater equipment, a tendency to condone secondary intermittency, in availability, of this auxiliary apparatus.

It is my purpose, in the few minutes accorded me, to

* Wilson Engineering Corporation, Chicago.

point out that it is no longer necessary to equip a locomotive with an expensive feedwater heater which is only properly available for a part of the time that heated water for delivery to the boiler is a requirement.

As above stated, to make the feedwater heaters constantly available, we must store the waste heat while we have it, to use when we need it. The equipment to meet this requirement must include a reliable hot-water boiler feed pump because the water must be pumped hot from the storage chamber. In stationary and marine design, this is simple, as hot-water displacement pumps have been available throughout the history of steam engineering. The size and weight of such pumping equipment has, until recently, prevented the possibility of creating these additional economies, in locomotive practice. But no longer can this properly be said to be true. The hot-water boiler feed pump used in the equipment to which I have reference, is the first of its kind. It weighs less than 700 lb.; measures less than 40 in. by 14 in. by 17 in; and with all of this limitation, it accepts water, boiling hot, and delivers it against highest normal boiler pressures, at better than 12,000 gals. per hour.

This has been accomplished in a device which provides for the storage of exhaust-steam-heated water in a hot well in the locomotive tender tank. This stored exhaust-steam-heated water is thus made available for use in supplying the boiler regardless of whether the locomotive is working, drifting, or standing.

It has been shown that a constantly available supply of exhaust-steam-heated feedwater in locomotive practice is highly to be desired from a standpoint of economy and efficiency. It remains for us to show also that this constant availability has a most important effect upon maintenance.

At the 1936 annual meeting of the Master Boiler Maker's Association, a competent speaker, in discussing pitting and corrosion, pointed out that the open-type feedwater heater acts as a de-aerator in driving off oxygen which would otherwise enter the boiler with deleterious effect, but that the benefits are lost in locomotive operation when frequent resort is made to the use of the injector. He substantiates his position by rightly stating that this freedom from oxygen corrosion is obtained in stationary plant boilers through constant dependency upon open type feedwater heaters for boiler feedwater supply.

The development of the first successful open heater with hot storage was the result of the time and energetic thought given the matter by the mechanical department officers of the railroad which conducted the experiments. and some eight or nine years ago when it was decided that we should follow best engineering principles and pump hot water from an exhaust-steam-heated and stored supply, instead of the then universal practice of pumping cold water through an intermittent heater, we also experimented with the idea of gaining the additional temperatures incident to exhaust back pressures.

It was observed that back pressures were coming down in modern design practice and it was the hard-headed decision of these gentlemen that this feedwater heater be kept as simple as possible, and that all efforts be directed toward maintaining the temperatures, allowable under atmospheric pressures, constantly available by reclaiming and storing the largest possible amount of exhaust steam heat and condensate.

Discussion by Mr. McBride

T. C. McBride based part of his discussion on the curves in Mr. Ostermann's graph of feedwater heater performance. He first called attention to the difference between the curves of optimum and imperfect performance of the feedwater heater and said that the open type heater maintained its optimum performance, so far as scale is concerned. He expressed the opinion that exhaust-steam injectors should be represented by a curve showing imperfect performance, as well as one showing optimum performance, because of the effect of scale on the nozzles. Speaking of the capacity added to the boiler by feedwater heaters, he said that, although 8 per cent was customarily used in the design of locomotives, heaters actually increase the steaming capacity by an average of 14 per cent. He also pointed out that, on the basis of 14 per cent capacity added to the boiler, the heater supplies about five and one-quarter times the heat per pound of weight that is supplied by the boiler per pound of boiler weight.

Cotton Belt Files Reorganization Plan

A PLAN of reorganization for the St. Louis Southwestern, providing for a new company to assume a portion of the present bonded indebtedness of the road, and to issue new common and preferred stock to refund other of the present securities, has been filed with the Interstate Commerce Commission and the Federal District Court at St. Louis, Mo., by the directors of the company. The plan specifies that the reorganized company would assume $20,000,000 in 4 per cent first mortgage bonds due 1989; $1,104,000 in equipment trusts of the parent company; and $500,000 in 5 per cent first mortage bonds of Gray's Point Terminal, and $450,000 in first mortgage bonds of the Shreveport Bridge and Terminal. The present second mortgage 4½ per cent bonds, due 1989, of which there are $6,957,500 pledged and $3,042,500 publicly held, would be refunded by a new second mortgage issue par for par. Additional amounts of the new second mortgage bonds would be issued in part payment for first terminal 5 per cent bonds due in 1952, of which $13,533,000 are pledged and $8,063,000 are publicly held. About $19,600,000 of the issue would be reserved for future additions to and betterments of the road.

The terminal bondholders would receive 25 per cent of their present securities in new second mortgage bonds, and the balance in new 4 per cent non-cumulative income debentures, with a 10 per cent premium payable in debentures to compensate for a clause in the present terminal bonds permitting payment in certain foreign currencies.

The new 4 per cent non-cumulative debentures also would be issued to retire existing general refunding bonds, and a note of $17,882,250 to the Reconstruction Finance Corporation, now held by the Southern Pacific. The general and refunding bonds are due in 1990, the issue consisting of $30,230,000 pledged and $9,327,500 publicly held. A note of $1,625,125 to the Railroad Credit Corporation would be assured in the form of a 10-year, 2 per cent serial note secured by the present pledged collateral.

A new issue of common stock is provided to refund present 5 per cent non-cumulative preferred stock on the basis of 70 per cent of par of the preferred. The new common also would retire present common stock; it would be offered on the basis of 35 per cent of par of the old common.

Leaders Optimistic on Rail Outlook

Messages received by New York Railroad Club on occasion of its annual dinner carry predictions of bright prospects for 1937

PREDICTIONS of bright prospects for the railways in 1937 comprised the transcendent note of optimism which pervaded the several messages received by the New York Railroad Club on the occasion of its sixty-fourth anniversary dinner, held at the Hotel Commodore, New York, on Thursday evening, December 10. These messages, which were distributed in pamphlet form to the 3,000 persons attending the dinner, were from national leaders in railroading, in equipment building and in industry generally.

J. J. Pelley, president of the Association of American Railroads, told how the carriers, "by skillfully combining the latest improvements of science and modern merchandising with more than 100 years of practical experience in transportation" have made themselves "ready to handle the traffic of tomorrow." Continuing to cite statistics of improvements in the economy of railway operation, Mr. Pelley referred also to increases in train speeds and various innovations which "are helping to sell to the world the knowledge of the fact that railroads are 'as modern as next year's fashions.'" Thousands of research workers, he added, keep the railways "geared to the tempo of tomorrow."

C. E. Smith, vice-president of the New York, New Haven & Hartford and retiring president of the Club, recalling doleful depression predictions that the railroads were "all through," pointed out how the cure—the "little traffic" which was all that was needed—is taking place. He continued to discuss increased railway purchasing from which the "railroad supply industry profits immensely"; and how the prosperity of the latter has stimulated activity in the sources of raw materials." The expansion in business, Mr. Smith says, is being handled by the railroads "without discomfort or delay"; and he is confident that railway carloading, stimulated thus far largely by the durable goods industry, will reach higher and higher levels when the building industry, which "has hardly started to awake," gets thoroughly under way.

Sees Large Increase in Equipment Buying

Lewis L. Schellbach, railroad editor of the Standard Statistics Company, believes that 1937's railroad history will be marked by substantially increased traffic and earnings; the resolution of many current uncertainties; progress in reorganizing roads in receivership; and substantially increased expenditures by railroads. He discussed each of these in turn, venturing the prediction that 1937 net would exceed a half billion dollars and that, with a 900,000 carloading peak next fall, "we should not be surprised to see a 60 per cent increase in freight car orders and 100 per cent increases in orders for both passenger cars and locomotives." Also, "maintenance expenditures will be stepped up further as service demands increase."

Samuel O. Dunn, editor of *Railway Age* and chairman of the Simmons-Boardman Publishing Corporation, found the causes of the current recovery in "the same natural forces that pulled us out of earlier depressions" and pointed out how railway net operating income will increase at a greater rate than the rise in gross revenues, unless "there are adopted government policies that unwarrantably and excessively increase operating expenses and taxes." He next stressed the tie-up between a rising net and increased buying by railroads, predicting, after citing statistics of recent equipment market activity, that there will perhaps be in the immediate future a repetition of what occurred following the war and the 1921-22 depression—first, relatively larger expenditures for equipment than for permanent structures, and then the reverse. In the "present unprecedented competitive situation," Mr. Dunn sees a demand for more frequent as well as faster freight and passenger services—a demand which, if it be met in the most economical fashion, "will require the exercise of the greatest ingenuity and ability available in both the railroad and the railway equipment and supply manufacturing industries."

Management and Labor Co-operation

Paul M. Smith, editor of the Locomotive Engineers Journal, official organ of the Brotherhood of Locomotive Engineers, discussed those matters of common interest on which railroad labor and management should co-operate. Railroad labor, he said, can utilize its organized strength to oppose the subsidizing of highway and water transport; to seek to bring about the enactment of laws (such as repeal of the long-and-short-haul clause) which will remove restrictions now standing in the way of augmenting railway traffic; to induce business men and acquaintances to ship and travel by rail; and to insist that commodities which they buy be shipped by rail. Mr. Smith pointed out how co-operation along these lines, which is specifically authorized in the preamble to the B. of L. E. constitution, has been promoted by articles, editorials and other material published in the Locomotive Engineers Journal.

R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, predicted that the Pettengill bill proposing repeal of the long-and-short-haul clause will be enacted at the next session of Congress. He pointed out how business men and railway labor have united with the railroads in the fight against the injustice of the present situation, and how "advocates of monopoly for water transport" were unsuccessful in the recent election in their attempt to defeat the repeal bill's author—Representative Samuel B. Pettengill of Indiana. With the latter "backed as he will be by the unanimous voice of labor, by the support of the great industrial and commercial interests of the country and by perhaps five-sixths of the people who have given the matter attention," Mr. Fletcher believes that there "can be no doubt" of the bill's early passage.

C. A. Liddle, president of the Pullman-Standard Car Manufacturing Company, discussing new light-weight trains, addressed himself in the main to the safety and operating economy of such equipment. In the former connection he asserted that "lightweight cars when properly designed provide the same factor of safety that older and heavier cars do." As to economies Mr. Liddle points out how these will be more readily realized as the present era of "tailored jobs" gives way to some standardization for this type of equipment. He further believes that the introduction of lightweight equipment "will

have a tendency to bring more travel to the roads that provide this new equipment because of the higher speeds which such trains will be capable of developing and because of their attractive appearance. This increase in travel, coupled with economies in operation which reduce power requirements in trains of equal length or make it possible to increase the tons of pay-load carried with the same power equipment will no doubt entice more and more railroads to operate such rolling stock."

George E. Scott, president of American Steel Foundries, pointed out how the railway equipment industry has continued its active research program throughout the depression years; and as a result "some amazing developments have been brought forth." He proceeded to observe how railway management, by taking advantage of these developments, "has proved again that discouraging conditions stimulate their activity toward service betterment, and the partial recovery which they have shared with industry in general this year has found the railroads ready and tested with improvements." It is Mr. Scott's view that "only private enterprise could so sharply react to the evidence of recovery."

Freight Car Construction Progresses Steadily

Charles J. Hardy, president of American Car & Foundry Company, told how the story of freight car construction since the turn of the century has been one "of progress steadily forward toward the twin goals of safety and efficiency." He does not think the limit of progress has yet been reached, but he does believe that the immediate problem "is to consolidate the positions already won, so that the further advance will be orderly and logical—not spasmodic or haphazard." In other words Mr. Hardy has "no thought" that "there will be an over-night rebuilding of the transportation facilities of the country"; but he has "no doubt" that "rebuilding will be the ultimate result." The cost of this will be great, he adds, but it will 'find its justification in increase of efficiency plus lessening of operating and other costs."

W. H. Cameron, managing director of the National Safety Council, spoke of "the enviable record in accident prevention" which has been set up by the railroads. He compared the 1935 accident record with that of 1913, calling attention also to the fact that "even in railroad grade crossing accidents" large reductions have been made during the past 10 years "in spite of the tremendous advances in hghway travel which have brought increases in the general toll of highway accidents." The railroad safety record, according to Mr. Cameron, "is and should be an inspiration to every other industry."

B. C. Forbes, publisher of Forbes Magazine, noted how the railroads are being rehabilitated in equipment, speed, efficiency and "in public understanding and favor." The latter, "more important," he continued, should "open up a new, brighter, broader era for rail transportation." In that connection Mr. Forbes advocates that the railway industry "should do more than it has heretofore done to bring home to the ordinary people the vital, gigantic, dominating part it plays in transporting the necessaries of life and in making living in our cities possible."

Charles D. Mahaffie, chairman of the Interstate Commerce Commission, traced briefly the development of federal regulation of transport, pointing out how certain portions of the field have not yet been covered. In his view "the greatest single transportation problem before the country today is how to use to the best advantage in the interests of the whole country each agency of transportation as a part of a national system so that each may render the most efficient service of which it is capable at the lowest practicable cost consistent with its efficient maintenance as a part of the national system." This process, he added, "is in active progress."

B. F. Fairless, president of the Carnegie-Illinois Steel Corporation, paid tribute to railroads generally, stressing their importance to the health and comfort of the people. He expressed also the pride which the steel industry takes in its role "in the development of railway facilities." In the latter connection Mr. Fairless cited the new alloys for light-weight equipment, advances in rail manufacture and co-operative research activities.

Rail Come-Back Encourages Investors

Philip A. Benson, president of the Dime Savings Bank of Brooklyn, N. Y., said that "institutional investors are encouraged by the demonstrated ability of the railroads to beat their way back from the depths of the greatest depression this country has ever known." Such investors, he said, will be guided in the extension of future credits to the railroad industry by the ability of managements to reduce competitive wastes through agreements to co-ordinate facilities and services; by the adoption of equitable and constructive government transport policies; and by the willingness of management to co-operate with labor, and labor with management, in the peaceful solution of their problems, and in furthering the prosperity and progress of the railroad industry. With the foregoing conditions placed Mr. Benson predicts that "the confidence of the institutional investors in railroad bonds will be restored, and there will be available a supply of private capital funds ample for the needs of the industry."

Charles A. Gill, general manager of the Reading and Central of New Jersey and newly-elected president of the club, presided at the dinner. The other newly-elected officers are: First vice-president, George W. Jones, vice-president of the Brooklyn-Manhattan Transit Corporation; second vice-president, W. G. Curren, general manager, New York Terminal Lines, Baltimore & Ohio; third vice-president, C. C. Hubbell, general purchasing agent, Delaware, Lackawanna & Western. H. H. Vreeland continues as chairman of the executive committee as does D. W. Pyeas secretary and treasurer of the club.

Cost of Carrying Passengers in a Sleeper.—Receiving an inquiry from a patron concerning the reason why railroad fares should be much higher in a sleeping car than in coaches, H. D. Pollard, receiver of the Central of Georgia, replies: "Pullman cars are operated by the railroads on a rental basis, figured upon the earnings of each car. If earnings fail to reach a certain figure, the railway makes up the deficit. Last year the Central of Georgia paid about $14,000 out of pocket for the privilege of supplying Pullman service to its patrons. It has paid as much as $25,000 in a year for this purpose. A Pullman car, with an occupancy maximum of 27 passengers, weighs at least ten tons more than a coach carrying 60 passengers. The railroads haul on the average three times as much weight for each Pullman passenger as for each coach passenger. Observation cars must be specially placed in or at the end of trains and require extra handling. Frequently Pullmans are on trains with an early morning arrival or departure. In such cases they must be placed or parked for occupancy to permit the passengers to observe the usual retiring or rising hour. This requires extra switching. It is estimated that it costs twice as much to handle each Pullman passenger as it costs to handle each coach passenger. If the Pullman rate per mile were lower, the coach rate per mile would probably have to be increased. There are many more coach passengers than Pullman passengers and it seems only fair to give this decided majority the benefit of lower rates.

Fitzpatrick Appointed President of Midamerica Corporation

Succeeds the late O. P. Van Sweringen as head of top holding company in railroad "empire"

HERBERT FITZPATRICK, vice-president (law) of the Chesapeake & Ohio and eight other railroad lines controlled by the Van Sweringen interests, has been elected president and a director of the Midamerica Corporation, peak unit in the Van Sweringen holding company "pyramid," to succeed O. P. Van Sweringen, whose death on November 23 was reported in the November 28 issue of the *Railway Age*. With this appointment Mr. Fitzpatrick becomes chief executive of the far-flung railroad domain, comprising about 25,000 miles of lines, built up by the Van Sweringen brothers, both of whom are now deceased, Mantis James, the younger, having preceded his brother in death by less than a year. At the time of going to press no announcement had been made concerning the filling of the many other vacancies in executive capacities in holding companies and railroads created by the death of Mr. Van Sweringen.

Herbert Fitzpatrick

Mr. Fitzpatrick's appointment was announced by George A. Ball, fruit jar manufacturer of Muncie, Ind., and George A. Tomlinson, Cleveland ship operator, who, at the invitation of the Van Sweringens, formed the Midamerica corporation in 1935 for the purpose of buying at public auction from J. P. Morgan & Company 2,064,492 shares of the Alleghany Corporation, which, with other securities, had been pledged by the Van Sweringens with the banking concern as collateral for loans. Since these securities represent control of the Alleghany Corporation, a holding company which, directly or indirectly, carries working control of the Chesapeake & Ohio and the other lines comprising the Van Sweringen group, Mr. Tomlinson and Mr. Ball, as owners of the Midamerica Corporation, became the dominating personalities in the Van Sweringen setup, although the brothers retained active direction of the properties. The more important of these, in addition to the C. & O., include the New York, Chicago & St. Louis (Nickel Plate), the Pere Marquette, the Erie, the Chicago & Eastern Illinois, the Missouri Pacific and the Wheeling & Lake Erie. In addition, through the Missouri Pacific, a one-half interest is held in the Denver & Rio Grande Western.

Mr. Fitzpatrick comes to his new position with a broad background of training and experience in corporate and legal matters. Prior to 1923, as a practicing attorney at Huntington, W. Va., he carried on an extensive practice among large corporations. Since that year, as an executive officer on the staffs of nearly all the larger lines included in the Van Sweringen group, he has had an opportunity to acquire an intimate knowledge of the legal and financial problems peculiar to the group as a whole. Moreover, with one of the largest of the affiliated lines—the Missouri Pacific—now in process of reorganization, it is considered particularly important that the affairs of Midamerica be directed at this time by one who is familiar with the status of the negotiations.

Commenting on Mr. Fitzpatrick's appointment, Messrs. Ball and Tomlinson, in a joint statement, said: "We shall expect him even more closely to co-ordinate the widespread activities of these varied interests, although realizing fully the great loss the properties have sustained in the passing of both the Messrs. Van Sweringen. He is the only member of the organization holding office in both the eastern and western lines in which the organization has investments. Obviously, he is most fully informed and fitted by experience to guide their affairs.

"He took a leading part with the Messrs. Van Sweringen in the so-called 'four-party' conferences which resulted in the general accord for more balanced railroad systems in the Eastern region, one of which is to be created from the properties represented in Midamerica. This gave him a broad acquaintance with the problems facing transportation."

Herbert Fitzpatrick was born on May 19, 1872, at Washington, Va., and was educated at Washington and Lee university, where he obtained the degrees of A.B. in 1892, LL.B. in 1893, and LL.D. in 1927. He was admitted to the bar in West Virginia in 1895, and entered the practice of law at Huntington, where he became a member of the firm of Fitzpatrick, Brown & Davis, which acted as counsel for many large corporations. At different times Mr. Fitzpatrick served as assistant prosecuting attorney of Cabell county, W. Va., and as city solicitor of Huntington. In 1923 he entered the service of the Chesapeake & Ohio as vice-president and general counsel, having the same title also on the Hocking Valley

(since absorbed by the C. & O.). In 1929 he was appointed also to the same position on the Pere Marquette and in the following year he was authorized by the Interstate Commerce Commission to become vice-president, law and corporate relations, of the Missouri Pacific and certain of its subsidiaries and affiliated lines. In 1935 Mr. Fitzpatrick's jurisdiction was extended to include the Nickel Plate.

At the time of his appointment as president of Midamerica Corporation he had jurisdiction, with the title of vice-president (law), over the Chesapeake & Ohio, the Nickel Plate, the Pere Marquette, the Missouri Pacific, the Gulf Coast Lines, the International-Great Northern, the Texas & Pacific and a number of smaller lines. He is also a director of the C. & O., the Pere Marquette and the Nickel Plate.

Golden Wedding Tribute to Carl Gray

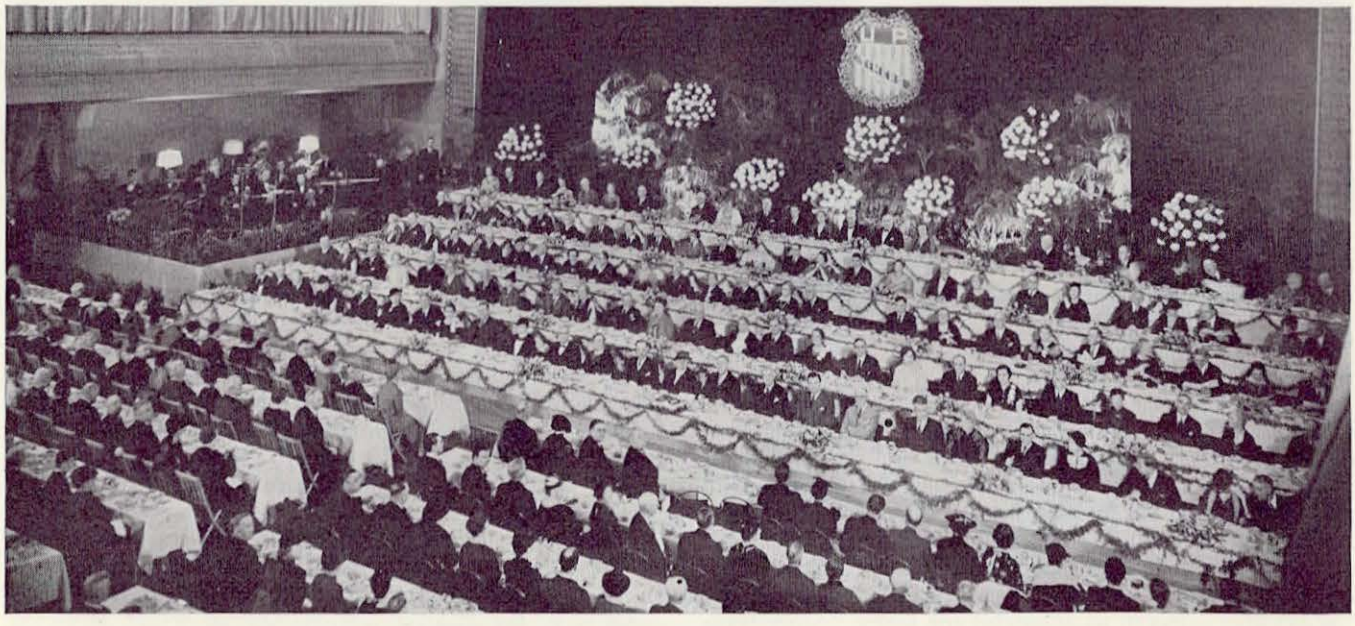
ONE hundred fifty three railroad and business executives and 1,247 "old timers" of the Union Pacific gathered at Omaha, Neb., on December 5, to pay tribute to Carl R. Gray, president of the Union Pacific, and Mrs. Gray, on their golden wedding anniversary. The gathering was sponsored by the Union Pacific Old Timers Club of Omaha, and was held in the city auditorium. Three special trains were required to transport the guests to Omaha, two bringing old timers from various portions of the system and a third bringing special guests from Chicago and the East. The latter, a solid room train of seven cars, handled by the Chicago & North Western, was arranged by that railroad and the Pullman Company. At noon Mr. Gray was host to 110 men at an informal luncheon, while Mrs. Gray was hostess to 85 women at another luncheon.

All arrangements for the banquet in the evening were made by the Omaha Old Timers Club. The auditorium was embellished for the occasion by pretentious decorations, walls of blue and gold being built about the banquet hall and the stage being decorated with chrysanthemums and ferns.

The banquet was prepared by the dining car department of the Union Pacific, while the serving was done by members of Company K of the Nebraska National Guard, who served as waiters and all of whom are employees of the Union Pacific. The food was prepared in a specially built kitchen, and was served in 38 min., or 2 min. less than the scheduled time of 40 min.

In order that all employees might participate in the celebration, the program was broadcast over station WAAW. This station was scheduled to leave the air at 6 p.m. in favor of other stations in the National Broadcasting Company network, but in honor of Mr. and Mrs. Gray this company waived its interference rights and the Federal Communication Commission granted WAAW permission to return to the air at 8 p.m. and broadcast the program.

William M. Jeffers, executive vice-president of the Union Pacific, acted as toastmaster. Following welcoming addresses by Dan Butler, mayor of Omaha, and Roy Cochran, governor of Nebraska, Samuel T. Bledsoe, president of the Atchison, Topeka & Santa Fe, made the congratulatory address. Other speakers included M. W. Clement, president of the Pennsylvania; J. J. Pelley, president of the Association of American Railroads; Heber J. Grant, president of the Mormon Church; W. A. Harriman, chairman of the board, and F. W. Charske, chairman of the executive committee of the Union Pacific; A. J. Konold, retired Union Pacific employee, who for nearly 25 years was general chairman of the Brotherhood of Locomotive Engineers on the Union Pacific; and Robert Syme, president of Old Timers Club of Omaha.



At Mr. and Mrs. Gray's Golden Wedding Anniversary Celebration

The Old Timers elected Mr. Gray a life member and presented him with an 18 carat gold membership card. The women's auxiliary made a similar presentation to Mrs. Gray. In addition, the officers of the Western Union Telegraph Company presented Mr. and Mrs. Gray with a Morocco leather bound volume containing

(*Continued on page 880*)

Wheeler Begins Finance Hearings

First act of Senator's "command performance" is opened with Van Sweringen associates in leading roles

WASHINGTON, D. C.

A NEW DRAMATIZATION of facts and inferences regarding the acquisition in September, 1935, of securities representing nominal working stock control of the Van Sweringen group of railroads and other companies by the Midamerica Corporation, most of the stock of which is now held by one man, featured the opening on December 7 of the long-postponed public hearings in connection with Senator Wheeler's investigation of railroad finance, before a sub-committee of the Senate committee on interstate commerce, of which Senator Wheeler is chairman. Senators Donahey and White were also present.

Probers Get $100,000, Will Ask for More

The investigation, authorized by a Senate resolution of March 20, 1935, has been carried on by a force of investigators working under the direction of Max Lowenthal as counsel for the committee, assisted by about 60 employees of the Interstate Commerce Commission. John Wheeler, son of the Senator, is also acting as attorney for the committee. The resolution limited the investigation to a list of railroads to be selected by Commissioner Eastman, then federal co-ordinator of transportation, who on July 5, 1935, named a list of 18 roads or systems, to which he added 7 more on June 15, this year, but it is understood that most of the attention of the investigators has been devoted to the affairs of the Van Sweringen roads and the Chicago, Milwaukee, St. Paul & Pacific, as representing examples of alleged "banker control" by J. P. Morgan & Co., and Kuhn, Loeb & Co. It has also been extended to the files and records of the Association of American Railroads. The committee has had appropriations of $100,000 for the purpose and is expected to ask soon for more.

At the opening of the hearing Chairman Wheeler read a statement as to its purpose, saying there had been considerable propaganda by certain organizations as to what he had in mind which was quite contrary as to what he actually had in mind. Before the hearing he had been quoted as indicating that one purpose was legislation imposing further restrictions on railroad holding companies, more stringent than those of the 1933 law which provided for their regulation by the Interstate Commerce Commission. The "propaganda" had referred to the idea of government ownership and the bill which Senator Wheeler had introduced but which he now says he will not put forward at the coming session of Congress.

Opening Statement by Senator Wheeler

"It is the intention of the committee," he said, "to conduct these hearings objectively towards the welfare of the American transportation system. Obviously there is no possibility of maintaining a solvent business if it has no earnings and this committee cannot be unaware of the vast shrinkage of income suffered by all roads in the last seven years. This, however, is far from the whole story of the disasters of railroad finance. Happily, earnings are now beginning to rise, both by reason of the present great increase of business and the efforts of many of the railroads, which have been forced by circumstances to improve the economy, efficiency and public service of their business.

"The welfare of the country demands that the railroads be maintained as a solvent financial system. Otherwise the money necessary for refundings or expansion will not be forthcoming and the holder of railroad securities, the shipper and railroad labor will all be endangered. We wish to determine the extent to which railroad financial difficulties result from avoidable capital losses and excessive fixed charges rather than simply from shrinkage in gross earnings.

"Our object is to be able intelligently to recommend to the Congress wise and workable legislation if we find that legislation is needed to improve the prosperity of our railroads and their ability to function most effectively.

The Association of American Railroads, through committees of lawyers and accountants, has made elaborate preparation for the presentation to the committee of a comprehensive review of railroad operation and finance and Senator Wheeler announced that the railroads would be given a full opportunity to be heard.

Securities Purchased by Midamerica

The first witness on Monday was George A. Ball, vice-president of Ball Brothers, manufacturers of glassware, Muncie, Ind., who with George A. Tomlinson, of Cleveland, Ohio, at the suggestion of the late Van Sweringen Brothers, had formed the Midamerica Corporation and through it purchased for $3,121,000 at public auction on September 30, 1935, two parcels of securities pledged as collateral for loans made to the Vaness Company and the Cleveland Terminal Building Company amounting to $39,500,000 plus accrued interest, by J. P. Morgan & Co., and associated banks. The loans were also guaranteed by O. P. and M. J. Van Sweringen. The securities thus acquired included 2,064,490 shares, or about 46 per cent, of the common stock of the Alleghany Corporation which represented working control of the Van Sweringen railroads.

It had been brought out before the Interstate Commerce Commission last February that Messrs. Ball and Tomlinson had subscribed for the stock of the Midamerica only upon the assurance that the Van Sweringen brothers would participate actively in the direction and management of the properties and that they had deposited 8,250 shares, or a majority of the common stock of the Midamerica, under a 10-year option agreement granting the brothers the right to purchase it at cost, $1 a share, plus 5 per cent interest after they had paid or adjusted all claims against them; and meanwhile the right to vote the stock. The option expired upon their death. Mr. Ball had later purchased most of Mr. Tomlinson's shares and now holds about 90 per cent of the Midamerica stock.

The Interstate Commerce Commission early this year made a careful investigation into the purchase by Midamerica with a view of determining whether it had jurisdiction over the company under the 1933 holding company amendment to the interstate commerce act, in connection with an application by Mr. Tomlinson for

authority to serve as director of the Forth Worth Belt, but the commission has never announced any conclusion, simply suggesting that Mr. Tomlinson withdraw the application. Mr. Tomlinson at the time took the position that the Midamerica was not subject to the commission's jurisdiction and O. P. Van Sweringen at the hearing testified that there had been no change in control because the securities acquired by Midamerica were those formerly held by the Van Sweringen interests.

Most of the testimony that went into the record was furnished by Senator Wheeler and Mr. Lowenthal, either in the form of questions addressed to Mr. Ball or in the form of statements which he was asked to have his staff correct if they were not accurate. He assented generally, saying he assumed the figures were approximately correct, but he questioned some of Senator Wheeler's conclusions and denied that he had ever assumed personal control or dictation over the affairs of the companies.

Control of "Vast Empire" (Mortgaged) Acquired by Midamerica for $274,682

From all of the facts put into the record Senator Wheeler asserted that for an investment of $3,121,000, of which $1,106,000 had been borrowed from a bank, and of which only $274,682 was allocated on the Midamerica books as the cost of the Alleghany common stock, Messrs. Ball and Tomlinson had gained control (now largely concentrated in Mr. Ball's name) the "vast empire" of 23,278 miles of railroad and other companies engaged in the operation of steamships, trucks, busses, refrigerator cars and street railways, coal mining and selling, exporting, forwarding, grain elevators, radio, and a peach orchard.

Total assets of the various companies controlled by the Alleghany Corporation, Senator Wheeler said, amounted to $3,183,285,783 at book value and the total capitalization to $2,943,304,324. These figures he compared with the $274,682 allocated to the Alleghany common stock, rather than with the total investment, thus sharpening the point of the pyramid. He did not emphasize that the capitalization included $1,781,000,000 of debt.

For another method of emphasizing the magnitude of this "control over other people's money and property," Senator Wheeler had figures prepared to show that one man had acquired for a comparatively small sum the "right" to control railroad purchases from manufacturers amounting to $42,905,159 and of fuel amounting to $18,411,305, and to "say who shall be employed" by railroads paying $8,215,892 in compensation to 1,543 executives and staff assistants, and $171,443,820 to 103,175 employees, for the year 1935. He also presented a list of the compensation of executive officers of the Van Sweringen roads amounting to $1,705,545 for 1935. "That's what you got for $275,000," he said.

"I would not assume I had that right," replied Mr. Ball. "There was no such intention here. It was left to the organization." Senator Wheeler insisted, however, that he had the power even if he had not exercised it and that after the Van Sweringens had acquired control of railroads they had placed their own men in charge. Mr. Ball said he did not know about that.

Mr. Ball testified that he had become a director of the New York, Chicago & St. Louis in 1932 at the request of the late J. J. Bernet and had become acquainted with the Van Sweringens about that time. On August 11, 1935, by arrangement through Mr. Tomlinson, O. P. and M. J. Van Sweringen had called on him at Muncie to ask for help. O. P. Van Sweringen, Mr. Ball said, had related the history of their work and said their financial situation was critical because the banks that held their securities were going to sell them in a short time and that they were seeking some one to purchase them at the auction. Mr. Van Sweringen had asked if Mr. Ball would be interested in doing so, saying he did not know what bids would be made, but thought that perhaps $2,500,000 would be required plus some bank help. Nothing definite was said about other possible bidders.

Mr. Ball agreed to think it over but advised the brothers to follow up any other lead they might have. He quoted Mr. Van Sweringen as saying that he did not know where else to go or what else to do. Later Mr. Ball suggested that Mr. Tomlinson take a third of the transaction and after a further conference at Cleveland on August 13 they agreed to form the Midamerica for the purpose, putting up $2,015,000 and borrowing the rest from the Manufacturers' Trust Company after being introduced to the president of the bank by the Van Sweringens. Mr. Van Sweringen at this time had gone further into a general description of the properties involved.

Mr. Ball read a list of the securities acquired by the Midamerica, which was the highest bidder at the sale on September 30 and when Senator Wheeler asked if if he knew what the Alleghany common stock controlled he began reading a list showing that the Alleghany held about 70 per cent of the Chesapeake Corporation common stock, 63 per cent of the Missouri Pacific common stock and 27 per cent of its preferred, some Wheeling & Lake Erie prior lien stock, 14 per cent of the Erie common, and 49 per cent of the New York, Chicago & St. Louis common stock.

At this point Senator Wheeler and Mr. Lowenthal called attention to a large chart showing the relation of the companies, headed by the Midamerica, prepared by the committee's staff from information furnished in returns to a questionnaire sent to the companies, and ask Mr. Ball to say whether it was correct or not, because some of the companies had not responded. Mr. Ball said he assumed it was substantially correct but for an hour or so he was questioned as to the business of the various companies, some 200 in all, including the smallest subsidiaries, and the percentage of their stock held by others. He disclaimed knowledge of such details, saying he knew he "would be in a lot of things" but that he had not yet attempted to become personally familiar with them. John P. Murphy, secretary of the Alleghany Corporation, said a check would be made and information furnished to make the chart correct.

The chart showed the Midamerica as holding over 46 per cent of the Alleghany common, but Mr. Ball said he did not want to be understood as saying that it therefore controlled it. Senator Wheeler insisted that 46 per cent represented control without a doubt and Mr. Lowenthal remarked that the shares owned by Midamerica constituted 70 per cent of those voted at the last meeting of the Alleghany. A similar question arose as to control of the C. & O. but Mr. Ball said he had no doubt that the C. & O. officers and directors had been drawn from the Van Sweringen group.

Senator Wheeler also read a statement of the market values of the securities on the day of the sale, including $2,838,676 for the Alleghany common, and on December 2, 1936, when the market value of the Alleghany common was $9,806,337. The market value of the total securities acquired by Midamerica on December 2, he said, was $13,492,294, as compared with $5,745,215 on the day of the sale, which was $2,264,219 more than the bid price. He referred to the increase of 432 per cent over the auction price and of 234 per cent over the

market price on September 30, 1935, as a "profit," but Mr. Ball said he had had no profit yet. He said he knew the market value at the time of the sale was considerably above the bid price and that he and Mr. Tomlinson were ready to pay somewhat more than they bid if necessary.

"Didn't you think it strange," Senator Wheeler asked, "that our great financiers would be willing to turn over to you for $3,000,000 stocks worth in the market $5,745,219 that gave you power over 23,000 miles of railroad?" Mr. Ball replied that he had not thought at first that it could be done but that he felt that it was an opportunity and he expected to make some money out of it. He did not think the stock could have been sold on that day for the market quotations. He had taken two-thirds of the Midamerica stock and Mr. Tomlinson had taken about one-third, less some taken by the Midland Bank, of Cleveland, but that later he had purchased most of Mr. Tomlinson's shares.

Van Sweringens Given Option on Stock

The principal facts developed had been brought out at the Interstate Commerce Commission hearing but without the degree of publicity that accompanies a Senate investigation, and, moreover, the Senate committee had power to subpoena records and correspondence of the bankers concerned. After having played up on Monday the magnitude of the power acquired by Mr. Ball, Senator Wheeler on Tuesday directed his questioning and the papers he put into the record to efforts to show that the purpose of the transaction was to retain control of the properties in the hands of the Van Sweringens and that they and the bankers had advance knowledge as to the amount of the bids to be made at the sale, with the result that the Midamerica bid was only about $40,000 higher than one of $3,000,000 made by a representative of the bankers.

He introduced a copy of the letter written to the Van Sweringens on September 21, 1935, by Messrs. Ball and Tomlinson, which had been furnished to the commission at its hearing, containing the option agreement giving them an opportunity to purchase control of the company by buying 8,250 of the 15,000 common shares at $1 a share, and meanwhile to vote the stock, while Ball and Tomlinson retained the preferred stock. The agreement was accepted by the Van Sweringens on September 30.

Referring to the fact that the option was given to the brothers exclusively and without the right of assignment, Senator Wheeler described it as designed to regain control for the Van Sweringens "without putting up a nickel" and to make it impossible for their creditors to attach it. Mr. Ball pointed out that he wanted the Van Sweringens to remain in control, saying that he expected to make his profit from the preferred stock, and that it was later arranged that they should have a drawing account of $100,000 a year. He added that their names were still on the notes to the bankers.

Senator Wheeler then produced correspondence between some of the banks, including a letter from the Morgan company to the Midland Bank indicating that as representing the participants in the loans it had established $2,700,000 and $300,000 as the "upset price" for the two principal lots of stock and intended to bid not less than those amounts. Another letter indicated, he said that the banks knew about what Van Sweringens' friends expected to bid.

After bringing out that the Midamerica had never applied to the Interstate Commerce Commission for authority to acquire railroads Senator Wheeler asked Mr. Ball as to his intentions for the future management. "That has not been determined," said Mr. Ball. "Our intention is to hold and operate and conserve these properties in an effort to give proper service to the public and give to the equity security holders a fair return on their investment." When he told of the selection of Herbert Fitzpatrick, who has been vice-president of the principal Van Sweringen roads, to succeed O. P. Van Sweringen as president of Midamerica and said that he might also be placed at the head of some of the other companies, Senator Wheeler produced a statement of Mr. Fitzpatrick's salaries ranging from $60,000 in 1928 to $91,996 in 1932 and down to $69,764 in 1934.

Senator Wheeler made some remark about Mr. Ball being Republican national committeeman from Indiana, and when someone else said that Mr. Fitzpatrick had been Democratic national committeeman from West Virginia he said "you ought to have a Socialist in the organization also." "I would be glad to talk to you about that," retorted Mr. Ball.

Harvey D. Gibson, president of the Manufacturers' Trust Company, New York, described a conference with Mr. Ball and the Van Sweringens at Cleveland in August, 1935, at which Mr. Van Sweringen appeared hopeful he would be able to work out a plan for keeping the securities and properties intact. Mr. Gibson said he did not know what the Morgan bid would be although he had a "general idea" and that Mr. Van Sweringen had discussed the amount necessary as from $2,700,000 to $3,000,00. He said he had no recollection of any discussion as to the future control but had assumed that the Van Sweringens "would remain in the picture in an important way." Senator Wheeler then produced a copy of a memorandum signed by Mr. Gibson on September 26 regarding a loan to be made to Midamerica, which referred to the Van Sweringens as "again regaining control of their complete railroad enterprise," backed by two capitalists in the Midwest, "the remainder of the common stock to be under option to the Van Sweringens." He said the loan was paid on December 24, 1935.

G. A. Tomlinson, the next witness, told of conferences with O. P. Van Sweringen in the summer of 1935 after the default on the loans, saying he had been disappointed in various efforts to refund the loans and "get himself on his feet again" and had finally asked Mr. Tomlinson if he could help out a little. Mr. Tomlinson said he did not know at that time how much money would be required but had been informed that Mr. Gibson would make a loan for part of it. He said he had borrowed most of what he had put in and had not gone into the plan for the purpose of making a profit but rather for the good of his home city and because of his friendship with Mr. Van Sweringen, as it was his feeling that the Van Sweringens were best able to manage the properties represented by the assets to be sold. He said that otherwise several hundred railroad people might be moved away from Cleveland and that "Senator Wheeler might even send them to Montana." He added that he had sold most of his Midamerica stock, without making any money, to Mr. Ball and to the Midland Bank. He also pointed out that although the securities were sold at a low price they were "subject to the mortgages and bonds" and also that the Van Sweringens' option would be good only after a large amount of debts had been disposed of.

Question Raised as to I.C.C. Jurisdiction

Senator Wheeler then touched briefly on the question of the legality of the Midamerica purchase without approval of the Interstate Commerce Commission, asking about the hearing on Mr. Tomlinson's application for authority to serve as director of the Fort Worth Belt. In the application Mr. Tomlinson was named as being a director of Midamerica among companies listed as not subject to the commission's jurisdiction. Senator

Wheeler then read from the 1933 "holding company" amendment the prohibition against activities to "effectuate, or to participate in accomplishing or effectuating" common control of two or more carriers without authorization of the commission and produced an extract from the testimony of O. P. Van Sweringen at the hearing on February 12 when he was asked whether there had been any time since the Midamerica was organized when any other person held the voting rights of the Alleghany stock. Mr. Van Sweringen had replied that counsel had advised him that the bankers at no time had the right to vote the stock, but Senator Wheeler read from that note to the Manufacturers' Trust Company a provision that the securities might be held in the name of the company and that it might exercise voting rights. Mr. Murphy said he was the one who had advised Mr. Van Sweringen as to his answer at the time but gave no explanation as he was to testify later.

Another Control of the Empire

When the hearing was resumed on Wednesday, Senator Wheeler temporarily transferred the control of the "empire" to the Guaranty Trust Company for the period from August, 1931, to February 1, 1936, giving another illustration of an opportunity for bankers to assert control over the various railroads which they preferred not to exercise. With W. C. Potter, chairman of the board of the Guaranty Trust Company, on the stand, after bringing out testimony as to the profits made in the handling of securities of Van Sweringen companies over a period of years, Senator Wheeler asked about the Alleghany bond issues, for which the Guaranty company was trustee, secured by pledge of the railroad securities owned by the Alleghany. There was a provision in the indentures which gave the trustee voting power over the stocks if the value of the collateral fell below 150 per cent of the amount of the bonds and Senator Wheeler asked Mr. Potter if this did not give the bank power to take control of the "empire" away from the Van Sweringens at any time after this occurred in 1931. Mr. Potter replied generally in the affirmative but said that he thought it was true only as to "part of the empire for part of the time."

Memoranda were then introduced showing various steps taken by the trustee under this provision of the indentures culminating in the issuance of proxies to the Van Sweringen interests. Senator Wheeler said that "the Van Sweringens then were simply nominees of the Guaranty Trust." Mr. Potter said he would say that they were the owners, although they could lose their control. When Senator Wheeler insisted that "you took it away and then gave it back to them," he agreed that that was probably a correct statement in substance, although he was somewhat doubtful if it was technically correct. Mr. Potter said he had consulted with representatives of the Morgan firm and that the banks did not feel that they could "run the empire"; and that to do so would require the purchase of additional stock. He also mentioned the desire on the part of some of the participants in the loan to record income tax losses. Mr. Potter said he felt that the Van Sweringens were the best men in the field to carry on the management.

There was put into the record copy of a memorandum by A. C. Nagle, vice-president of the First National Bank, said to have been taken from the files of George F. Baker, regarding the subject of salaries for the Van Sweringens, dated March 23, 1935, in part as follows:

"On March 11, Mr. Stanley telephoned to say that the Van Sweringens, heretofore having drawn no salaries from their enterprises and for some time having been living on their insurance, are up against it to provide for living expenses. They estimate their joint requirements to be $150,000 a year, the principal items being the following:

Living expenses	$30,000	
Dependent relatives..	25,000	
Upkeep of farm....	20,000	
Taxes	20,000	to $25,000
Insurance	25,000	

"It is proposed that they draw salaries aggregating $75,000 from their companies, presumably Chesapeake Corporation, etc., and that the other $75,000 be provided in some way out of or by the participants in the Credit. The Corner is willing to agree to this scheme because they feel that the Van Sweringens are the only ones who can handle this very intricate situation for them. The other banks have acquiesced, although one institution stipulated that the Cleveland banks should carry their share. * * * The Van Sweringens themselves, he thinks, would be willing to live in a modest flat between them. Mr. Stanley defends the other items on the list by stating that if these men are to do a good job for the creditors their minds should be free from worries such as providing for their living and taking care of their dependent family. * * * I again referred to the maturity of May 1. He said that the Cleveland interests were working on a program that would involve apparently the pooling of all loans, subject to the preservation of certain preferences, but that they had not yet presented the picture to him and he could not now go into details. I asked him whether in view of the fact that the maturity is just a little more than a month off it would not be better to couple any program for pay to the Van Sweringens, if any is decided upon, with whatever program is to be followed with respect to the liquidation or renewal of the loan. He agreed that was a reasonable expectation."

Finish Forwarder Probe at Chicago

THE hearings before the Interstate Commerce Commission in the investigation of freight forwarding companies adjourned at Chicago on December 9, after eight days of testimony. Hearings will be resumed at St. Louis, Mo., on or about January 25, and subsequent hearings will be held at Dallas, Tex., Portland, Ore., and San Francisco, Cal.

There is no proper place in the transportation or business world for a freight forwarding company which does not operate on rails or run a truck line, according to the testimony of E. A. de Funiak, freight traffic manager of the Louisville & Nashville. He said that the transportation of the country should be conducted by common carrier railroads, common carrier trucks and common carrier waterways. In his indictment of freight forwarding companies, he contended that these companies perform no service which the railroads cannot do; that while forwarding companies have turned some traffic over to the railroads, their competition has seriously depleted the carriers' revenues and has created a situation of uncertainty on the part of shippers as to what one shipper pays compared to what others pay; and that unless the practice of making all-commodity rates is stopped, the whole rate structure of the railroads will have to be junked, for all-commodity rates not only dis-

rupt l.c.l. rates but, in many cases, jeopardize carload rates as well.

Because of the extension into the South of the activities of forwarding companies operating over railroads in official classification territory, the Louisville & Nashville has lost a large amount of traffic, with the result that this railroad is forced to handle a somewhat lower class of traffic, since the forwarding companies, as a rule, solicit higher rated commodities for transportation by truck. The Louisville & Nashville has declined to enter into agreements with forwarding companies, believing that they are not in the interests of the public and do not constitute a sound and conservative means for doing business. Forwarding companies are not the type of concerns that the L. & N. cares to encourage in the South.

As early as 1923, according to Mr. de Funiak, the Louisville & Nashville was approached by forwarding companies, but the price they desired to pay was not attractive to the railroad. It would have been necessary for the Louisville & Nashville to make certain rate arrangements to meet truck competition and, in addition, to furnish warehouse facilities. One forwarding company wanted the railroad to advance and collect its charges as well as those of the railroad on shipments from Cincinnati, Ohio, into the South. Two years later, the same company approached the railroad again, but was told it would have to seek its own facilities as other shippers do. Still later, this company sought the use of L. & N. warehouse facilities at Birmingham, Ala., where the freight house was not completely occupied. The railroad quoted a rental figure based on a return of six per cent on the investment, plus three per cent for taxes, which the forwarding company did not accept.

L. & N. Meeting Truck Competition

The Louisville & Nashville, continued Mr. de Funiak, has taken steps to meet truck competition. The first was to give complete door-to-door service. In March, 1933, the service was rendered up to 260 miles, but later the radius of the service was advanced to 360 miles. L. & N. freight houses are opened earlier, making freight available for delivery early in the morning instead of later in the afternoon, and all stations of any consequence are worked Sundays and holidays, while some stations are worked all night.

To compete with all-commodity rates, the L. & N. uses an any-quantity rate which is not discriminatory against small shippers. Although the L. & N. has endeavored to protect its traffic, his attention, he said, has been called to practices engaged in by forwarders which the Louisville & Nashville cannot meet under the requirements of the Interstate Commerce Act.

As a result of its efforts, the Louisville & Nashville, in 1935, handled 620,000 tons of merchandise in its pick-up and delivery service, while the tonnage for 1936 will be about 25 per cent more. The cost of handling this business in 1935 was approximately $500,000, while the gross revenue in that year was $5,600,000. The revenue for 1936 will be about 25 per cent more.

Eleven Forwarders on Pennsylvania

Walter S. Franklin, vice-president in charge of traffic of the Pennsylvania, testified that this railroad uses 11 forwarding companies, the larger ones being Acme, Gregg, National and Universal. While the Pennsylvania has all-commodity rates in competitive territory, it does not favor the general application of these rates. In 1935 it handled approximately 1,000,000 tons of freight for forwarding companies. However, he said, the forwarding companies perform no service which the Pennsylvania cannot render through its collection and delivery service. The only advantage to the shipper, he said, is a lower rate, although the railroads have the power to make competitive rates and, in some instances, have.

Forwarders' rates, he said, should be filed and observed. At present some consideration is being given to the making of rates that would be equal to the rates that forwarders are applying for the longer distances. The plan discussed would establish a special scale of rates which would apply only on merchandise. They would be slightly higher than the present scale for the shorter distances, and would be reduced gradually according to distance. The lowest portion of the scale would be for distances between 350 and 700 miles, after which the rates would gradually increase for greater distances. In addition, there has been some discussion of establishing quantity rates which would be somewhat lower than the per-hundred-pounds rates, based on quantities of 500 lb. and higher. These rates would include pick-up and delivery.

R. F. Marshall, vice-president of the Chesapeake & Ohio, the New York, Chicago & St. Louis, the Pere Marquette and subsidiaries of these companies, and a director of the Standard Carloading Corporation and the National Freight Forwarding Corporation, told how the latter company was formed on November 7, 1931, when the Standard Freight Forwarding Company, the National Freight Company and the Commerce Company turned their properties and business over to this company. With this organization, the National Freight Company owns 51 per cent, the Standard Freight Forwarding Company 35 per cent and the Commerce Company 14 per cent of the stock of the National Freight Forwarding Corporation. Standard, in turn, is owned by stockholders of the Virginia Transportation Company, the Lake Erie Coal Company, Ltd., and the Erie Land & Improvement Company.

E. L. Gray, vice-president in charge of traffic of the Erie, testified that his company uses the National Carloading Corporation and the Lifschultz Company. He had no objection to a reasonable regulation of forwarding companies.

E. R. Oliver, vice-president in charge of traffic of the Southern, testified that this railroad uses the Universal Carloading and Distributing Company and the Acme Fast Freight, Inc., but that it, as well as other railroads serving the same territory, has not established all-commodity rates. He was of the opinion that the Southern would run into difficulty in the southern territory if these rates were used. When the Southern attempted to establish such rates for cotton factory products, the mills objected, contending that such rates would obscure costs and thereby work to the disadvantage of the mills. He also said that with such rates much of the l.c.l. traffic now handled by the Southern would be transferred from the rails to trucks.

North Western Operations Discussed

P. F. Marsh, investigator for the Interstate Commerce Commission, reported on the operations of forwarding companies on the Chicago & North Western. On this railroad, National handles shipments between Chicago and Des Moines and Chicago and Omaha, Neb., and Universal between Chicago and the Twin Cities. In 1935 National shipments totaled 292 cars from Chicago to Des Moines, and 833 from Chicago to Omaha. In the same year, 8,441 cars and 1,520 compartments were handled by Universal or its subsidiary, the Transcontinental Freight Company. National's traffic between Chicago and Des Moines was handled in baggage cars in passenger trains for a short period in 1934 and was

resumed on December 23, 1934, when the Chicago, Rock Island & Pacific gave passenger train service on Universal shipments. All roads abandoned the practice on June 18, 1935. In 1934 the North Western provided overnight service on Universal traffic and on certain of its own traffic between Chicago and the Twin Cities, handling the traffic in baggage and milk cars, on a schedule of 11 hr. This service was abandoned after a short time.

R. C. Kerr, assistant freight traffic manager of the North Western, said that most of the business moving under the 55 cent all-commodity rate from Chicago to the Twin Cities was that of forwarding companies, although some others, mainly consolidators and chain stores, use the all-commodity rate. He also said that when instances of lightly loaded cars are brought to his attention he corrects the practice. On September 1, 1936, he continued, the all-freight rate between Chicago and the Twin Cities was reduced from 55 cents to 35 cents, with a minimum of 30,000 lb., and under that rate the switching at Chicago was absorbed by the North Western and that at St. Paul and Minneapolis by the Chicago, St. Paul, Minneapolis & Omaha. This reduction was made following the placing in effect by the Chicago, Rock Island & Pacific of a rate of $42.50 per loaded trailer for hauling the trailers of the Keeshin Company, because forwarding companies demanded a competing rate and because the North Western wished to hold the traffic of forwarding companies which threatened to use the Rock Island trailer service, and that of shippers such as Montgomery Ward & Company, Sears-Roebuck & Company, the Great Atlantic & Pacific Tea Company and the Jewel Tea Company, which threatened to use trucks. While the switching charge of $12.84 at Chicago is absorbed by the North Western, and $8 at the Twin Cities by the Omaha, thus taking $20 from the rate, he felt that with the flat minimum of 30,000 lb. the net revenue has gained. For example, in October, 1936, the revenue per car to the Twin Cities averaged $125.08, while that on 59 cars from miscellaneous shippers averaged $137.30 per car. During this month 145 cars of Universal freight were handled from Chicago to the Twin Cities. Mr. Kerr was of the opinion that instead of Railway Express Agency, Inc. being used to handle traffic, the railroads be permitted to buy and own the forwarding companies.

Wabash Handles Acme Freight

Walter S. Rice, investigator for the commission, reported that at the Chicago freight house of the Wabash, Acme leases 2,500 sq. ft. of space but uses 33,000 sq. ft., for which the Wabash charges no rental, on the theory that all traffic therein is freight upon which the carrier has received the line haul and because, under the tariff, which provides a charge of 50 cents per ton for unloading, it is obliged to furnish space in which to do the unloading. From January 1, 1935, to December 31, 1935, he said, 10,699 cars, or 101,830 tons, were unloaded by the Wabash, at a total labor cost of $255,134, while the Wabash collected $56,006 from Acme. Based upon the tariff charge of 50 cents per ton, plus the emergency charge, Mr. Rice placed the out-of-pocket loss at $199,127. From January 1, 1935, to December 31, 1935, he continued, 5,867 cars, or 63,051 tons, were loaded by the Wabash at a cost of $83,615 for which the Wabash collected $34,678.

C. C. Wall, also an investigator for the commission, testified that at Detroit two sections of the Wabash inbound freight house, 21,035 sq. ft., and 18,056 sq. ft., respectively, are set aside for Acme traffic. Wabash employees unload cars to the platform, then deliver the shipments to designated spots and later carry the merchandise from the spots to highway trucks. In loading freight, Acme employees take the merchandise from the trucks, sort it according to destination, and label it, while the loading of the cars is performed by Wabash employees. No weighing is done unless the forwarding company's customers' weight is questioned. During May, 1936, it cost the Wabash $1.26 per car for unloading Acme traffic, compared with 80 cents per ton for its own l.c.l. business.

Golden Wedding
Tribute to Carl Gray

(*Continued from page 874*)

more than 1,000 telegrams of congratulations received from business executives, chambers of commerce and other organizations.

The Guests

Among the guests were the following: L. W. Baldwin, chief executive officer, Mo. Pac., St. Louis, Mo.; S. T. Bledsoe, president, A. T. & S. F., Chicago; Ralph Budd, president, C. B. & Q., Chicago; J. E. Buker, vice-president, Vapor Car Heating Company, Chicago; Newcomb Carlton, chairman, Western Union Telegraph Company, New York; F. W. Charske, chairman executive committee, U. P., New York; M. W. Clement, president, Penna., Philadelphia, Pa.; Hon. R. L. Cochran, governor of Nebraska, Lincoln, Neb.; D. A. Crawford, president, Pullman, Inc., Chicago; Charles Donnelly, president, N. P., St. Paul, Minn.; Samuel O. Dunn, chairman, Simmons-Boardman Publishing Corporation, Chicago; Judge R. V. Fletcher, vice-president and general counsel, A. A. R., Washington, D. C.; A. A. Frank, president, Standard Railway Equipment Company, Chicago; W. S. Franklin, vice-president, Penna., Philadelphia, Pa.; J. E. Gorman, trustee, C. R. I. & P., Chicago; H. J. Grant, president, Church of Latter Day Saints, Salt Lake City, Utah; C. R. Gray, Jr., vice-president and general manager, C. St. P. M. & O., St. Paul, Minn.; W. A. Harriman, chairman, U. P., New York; C. E. Johnston, president, K. C. S., Kansas City, Mo.; P. H. Joyce, trustee, C. G. W., Chicago; W. P. Kenney, president, G. N., St. Paul, Minn.; Leroy Kramer, executive vice-president, General American Transportation Corporation, Chicago; C. A. Liddle, president, Pullman-Standard Car Manufacturing Company, Chicago; W. P. Murphy, chairman, Standard Railway Equipment Company, Chicago; J. J. Pelley, president, A. A. R., Washington, D. C.; N. B. Pitcairn, trustee, Wabash, St. Louis, Mo.; J. H. Rodger, vice-president, Oxweld Railroad Service Company, Chicago; F. W. Sargent, president, C. & N. W., Chicago; H. A. Scandrett, trustee, C. M. St. P. & P., Chicago; R. B. White, president, Western Union Telegraph Company, and J. H. Young, assistant to president, Union Switch & Signal Company, Chicago.

The Southern of Great Britain has recently announced plans for the continuation of electrification work on its outer London suburban system as far as Reading, and for the completion of electrification on various smaller sections in the Aldershot and Guildford regions. The projects involve 88 track miles on 43 route miles; they will cost approximately £1,000,000 and are expected to be completed by 1939.

Odds and Ends . . .

Construction Fifty Years Ago

J. M. Davis, president of the Delaware, Lackawanna & Western, sends in the following letter as indicative of construction costs nearly 50 years ago. It was written by Andrew Reasoner, superintendent, to President Sam Sloan, of the Lackawanna, and is dated May 23, 1888.

"During the past two weeks I have had two meetings with representative citizens of Mendham in reference to the proposed branch from Morristown to that point. I find them very anxious to have the branch built and that they have procured the right of way in Mendham township, also raised by subscription the sum of $8,000 toward paying for the right of way in Morris township and the city of Morristown.

"Our engineer has made an estimate of the cost of right of way which I think is a very liberal one—based on figures given in some cases by the owners—and making a liberal allowance for damages, etc., and makes the cost of right of way in Morris township and Morristown at $18,050. Applying the sum of $8,000 raised by citizens of Mendham, there would be the sum of $10,050 to be expended for right of way.

"The following is his estimate giving cost of the road, exclusive of sidings, of which no estimate can be given at present, as their length and location will depend upon the business of the different stations. It however includes five depots, turntable, enginehouse and water supply at Mendham.

Estimated cost of building road from Morristown to Mendham:

Grading, masonry and iron bridges	$115,885
Right of way, to be procured	10,050
Incidental expenses, engineering, etc.	5,800
	$131,735
8.07 miles track laid and ballasted, 67 lb. steel	58,911
5,120 rods fence—$2	10,240
	$200,886
4 depots 18 ft. by 30 ft. frame—$1,200	4,800
Depot at Mendham 20 ft. by 60 ft. frame	2,400
Turntable at Mendham (without masonry circle)	1,500
Enginehouse at Mendham	2,500
Water supply at Mendham, well, tank and pump	1,500
	$213,586

New Books . . .

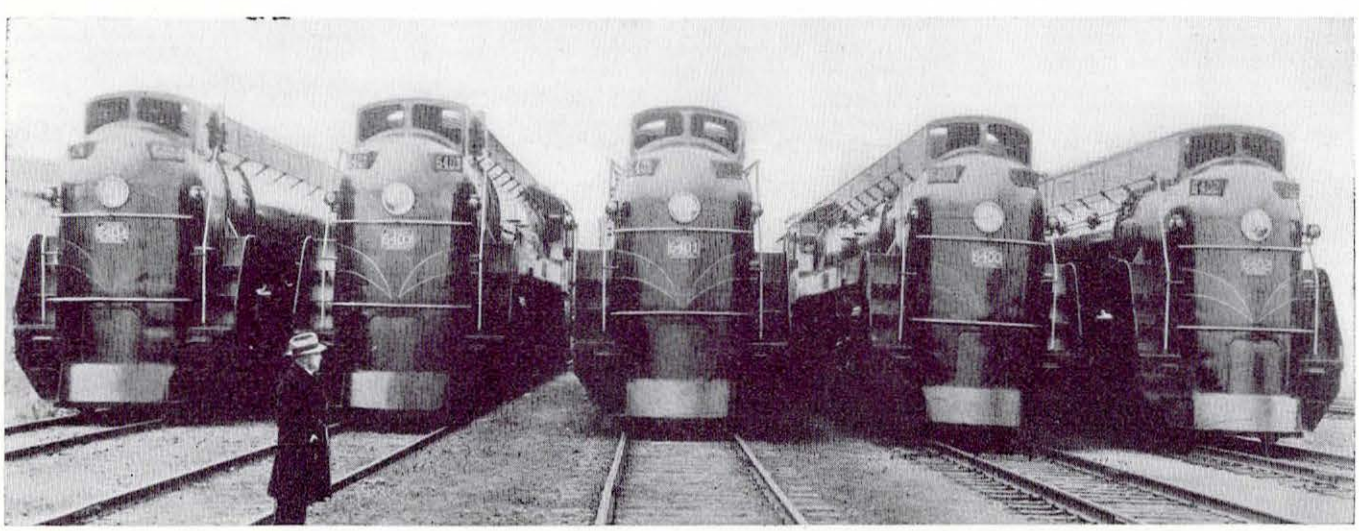
The Story of Bridges, by Archibald Black. 6 in. by 9 in., 226 pages. Bound in cloth. Published by Whittlesey House, McGraw-Hill Book Company, Inc., 330 West 42nd street, New York. Price $2.50

Great bridges have a romantic appeal to every-one, and while the author has endeavored to tell the story of bridge building from ancient times to the present day, he has given primary attention to the world's great bridges, as having the greatest interest for the lay reader, for whom the book has been written. Acknowledgment is given to a number of bridge engineers for their assistance in reading and correcting the text. The author is to be commended for the degree of accuracy obtained, although it is doubtful if his audience will in all cases gain a clear comprehension of some of the complex construction procedures described. Nevertheless, the book affords a pleasant means of gaining the salient facts concerning a larger number of famous structures. In dealing with the human side of his subject, namely, the men who built the bridges, the author has given scant attention to, or has failed to mention at all, a number of outstanding bridge engineers who have played as large a part in the advance of the art of bridge design and construction as the men who have been given the center of the stage in his story.

Wrought Iron, by James B. Aston and Edward B. Story, consulting metallurgist and chief metallurgist, respectively, A. M. Byers Company. 6¼ in. by 9¼ in. 59 pages. Bound in cloth. Published by A. M. Byers Company, Pittsburgh, Pa. Price $1, but free copies may be had on request on letter-head of potential users of wrought iron and faculties of engineering schools.

The discovery of the Aston, or Byers, process for the manufacture of wrought iron on a quantity production basis has excited renewed interest in an old material, and this book has been written with the object of providing authoritative information concerning it as well as to point out the opportunities for its use. Following a brief history of wrought iron, the first of the ferrous metals to be used, the text explains how the new process is applied to produce material having characteristics that are identical with those of the puddled iron. Other chapters explain the physical nature of wrought iron, with its inclusion of many minute fibres of slag, and show how this peculiar structure affects its resistance to corrosion. Also included are a discussion of specification requirements, a review of the uses of wrought iron, some suggestions for material selection and a glossary of terms relating to wrought iron manufacture and its products.

* * * *



New Quintuplets for Doctor Dafoe. The Famous Country Doctor Looks Over Three Million Pounds of "Quints," the New 6400 Type of Streamlined Locomotives Used on the Canadian National

NEWS

P.R.R. Agrees to Acquire Motor Truck Lines Directly

Will comply with conditions proposed in I. C. C. decision on purchase of Barker Motor Freight, Inc.

Arrangements for the direct acquisition by the Pennsylvania of all interest of the American Contract & Trust Company in the Pennsylvania Truck Lines, Inc., so as to bring the Pennsylvania's truck subsidiaries directly within the jurisdiction of the Interstate Commerce Commission without the intervention of a holding company, have been announced by the Pennsylvania by filing with the commission a tender of compliance with conditions proposed by Division 5 of the commission in a report made public on October 8. In this report the commissioners declined to approve or authorize the proposed purchase by the Barker Motor Freight, Inc., of the property and certificates of the Barker Motor Freight Lines and the acquisition by the Pennsylvania Truck Lines, Inc., of control of the Barker Motor Freight, Inc., unless the conditions were complied with.

In an intervening petition the Pennsylvania asks the commission to approve the necessary steps and says the American Contract & Trust Company, all of the stock of which is owned by the Pennsylvania, is willing to sell and the Pennsylvania is willing to purchase all the stock of the Pennsylvania Truck Lines as follows: 1,500 share, or 100 per cent, of the preferred stock for $150,000; and 1,081 shares, or 71 per cent, of the common stock for $98,276. It is also proposed that the Pennsylvania shall purchase 436 shares, or 29 per cent of the common stock, for $19,390 from Scott Bros., Inc., the entire stock of which is owned by the American Contract & Trust Company. The prices are said to represent the cost to the companies now owning the stock. The Pennsylvania has been informed by its counsel that it has legal right under its charter to acquire the stock. The commissioners had objected to the use of the American Contract & Trust Company as a "link in the chain of railroad ownership," because it is not subject to the commission's jurisdiction, whereas both the railroad company and the trucking company are under the interstate commerce act.

Compliance also was tendered with another condition proposed by the commissioners under which it is agreed that the service to be rendered by the Pennsylvania Truck Lines over the motor routes of the Barker company shall be confined to service auxiliary and supplementary to that performed by the railroad in its operations and in territory parallel to and adjacent to its rail lines. It is specified particularly that this shall include: (1) the handling of freight by the railroad under contract and pursuant to tariffs of the railroad company and/or under tariffs of the truck company and the railroad providing for joint rail and truck routes and rates, which is designated as auxiliary service, i.e., service designed to aid the Pennsylvania in discharging obligations assumed by it; and (2) the handling of freight by the truck company as a common carrier by motor vehicle and subject to its lawful tariffs, in service supplementary to the service of the Pennsylvania, i.e., filling out and supplying transportation for service additional to that of the railroad.

The truck company has also submitted a statement of routes and a description of the territory over which and within which it proposes to operate, including points served by the Pennsylvania, points on the present route of the Barker company, and interchange of traffic with other common carriers at any of the foregoing points.

Club Meeting

The Southern and Southwestern Railway Club will hold its next meeting at the Ansley Hotel, Atlanta, Ga., on Thursday, January 21, at 10 a. m. Samuel O. Dunn, editor of the *Railway Age*, will speak on the future of the railroads.

New Japanese Railways Representative at New York

Keiichi Yamanouchi has been appointed resident representative in the New York office of the Japanese Government Railways. He succeeds K. Uchiyama, who is returning to Japan to assume new duties at the Tokyo headquarters of the railways.

Railroad Employment up 9.73 Per Cent in November

Class I railroads have reported to the Interstate Commerce Commission a total of 1,092,080 employees as of the middle of the month of November, an increase of 9.63 per cent as compared with November, 1935, although this represented a decrease of 1.57 per cent as compared with the number in October. The number in the maintenance of way and structures group showed an increase of 12.4 per cent over the number last November. The maintenance of equipment and stores group increased 11.58 per cent, and the train and engine service group increased 10.06 per cent.

The Government-Owned Alaska Railroad in 1936

Statement by its general manager included in annual report of Secretary of Interior

Operating revenues of the Alaska Railroad for 1936 were $1,868,526, an increase of $349,570, or 26.76 per cent over the comparable figure for 1935, according to a statement by O. F. Ohlson, general manager, included in the annual report of the Secretary of the Interior. Operating expenses were $1,888,934, an increase of $331,371.12, or 21.27 per cent, due to increased train service, also because of expanding the program of improvements and rehabilitation, consisting of ditching, bank widening, grade raising, ballasting, replacing wooden culverts with concrete pipe, placing rock to protect roadbed against erosion from rivers and streams, and making line changes to eliminate snowsheds.

The operating deficit amounted to only $17,443, a reduction of $56,230, or 76.3 per cent. The deficit figure includes an expenditure of $27,121 made during 1936 for investigation of mineral and other resources, which amount, if deducted, would produce an operating profit of $9,677.

Passenger earnings in 1936 increased $66,431, or 38.04 per cent. Freight earnings for the year increased $249,039, or 21.84 per cent.

The rail-line revenue passengers in 1936 increased 19,771, as compared with last year, which was in part due to the increased tourist travel and in part to local travel between Anchorage and Palmer. Rail-line freight tonnage handled increased 41,796 tons, divided 19,145 tons to coal shipments and 22,651 tons to miscellaneous merchandise. The increase in freight tonnage is attributable to the result of improved business conditions.

The pay roll for 1936 amounted to $1,572,454, an increase of $233,628 over the previous year. Increased employment, necessitated by the greater volume of traffic handled, accounted for the greater part of the increase in pay roll, while a substantial part was due to the restoration of pay-roll deductions.

C. N. R. to Expand Shop Work

A substantial increase in the working time in C. N. R. shops, effective the first of the year, was announced last week by S. J. Hungerford, president of the Canadian National.

In view of the general increase in business, he said, there was a demand for more locomotive and passenger car work.

Ten Months Railway Net a 2.36 Per Cent Return

$524,627,844 an increase of 32.3 per cent over last year; October net up 19.1 per cent

Class I railroads in the first ten months of 1936 had a net railway operating income of $524,627,844, which was at the annual rate of return of 2.36 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. This was an increase of 32.3 per cent as compared with the first ten months of last year, when the net was $396,656,269, or 1.78 per cent. In the first ten months of 1930 the net railway operating income was $759,038,637, or 3.43 per cent.

CLASS I RAILROADS—UNITED STATES

	1936	1935	1930
Month of October			
Total operating revenues	$391,457,301	$341,039,092	$477,966,434
Total operating expenses	261,212,360	232,521,777	322,443,081
Taxes	28,467,659	21,663,426	31,791,258
Net railway operating income	89,851,409	75,454,501	110,923,349
Operating ratio—per cent	66.73	68.18	67.46
Rate of return on property investment—per cent	2.73	2.29	3.35
Ten Months Ended October 31			
Total operating revenues	$3,321,921,613	$2,852,818,220	$4,512,318,485
Total operating expenses	2,425,814,173	2,149,914,981	3,340,656,001
Taxes	259,959,157	204,181,082	303,226,866
Net railway operating income	524,627,844	396,656,269	759,038,637
Operating ratio—per cent	73.02	75.36	74.03
Rate of return on property investment—per cent	2.36	1.78	3.43

Operating revenues for the first ten months of 1936 totaled $3,321,921,613, compared with $2,852,818,220 for the same period in 1935, and $4,512,318,485 for the same period in 1930, an increase of 16.4 per cent in 1936 above 1935, but 26.4 per cent below 1930. Operating expenses for ten months amounted to $2,425,814,173, compared with $2,149,914,981 for the same period in 1935, and $3,340,656,001 for the same period in 1930. Operating expenses for the first ten months of 1936 were 12.8 per cent greater than in the same period of 1935, but 27.4 per cent below 1930.

Class I railroads in the first ten months of 1936 paid $259,959,157 in taxes, compared with $204,181,082 in the same period in 1935, and $303,226,866 in the same period in 1930. For the month of October, the tax bill amounted to $28,467,659, an increase of $6,804,233 or 31.4 per cent above October, 1935.

Twenty Class I railroads failed to earn expenses and taxes in the first ten months of 1936, of which eight were in the Eastern District, three in the Southern district and nine in the Western district.

Class I railroads for October had a net railway operating income of $89,851,409, at the rate of 2.73 per cent. In October, 1935, their net was $75,454,501, or 2.29 per cent, and in October, 1930, it was $110,923,349 or 3.35 per cent. Operating revenues for October amounted to $391,457,301, compared with $341,039,092 in October, 1935, and $477,966,434 in October, 1930. Operating expenses in October totaled $261,212,360, compared with $232,521,777 in the same month in 1935, and $322,443,081 in October, 1930.

Class I railroads in the Eastern district for the ten months had a net railway operating income of $310,636,915, at the rate of 2.97 per cent. For the same period in 1935, their net was $248,780,315, or 2.38 per cent, while in 1930 it was $388,453,595 or 3.83 per cent. Operating revenues in the Eastern district for ten months in 1936 totaled $1,674,527,312, an increase of 15.8 per cent compared with 1935, but a decrease of 25.2 per cent compared with 1930. Operating expenses totaled $1,179,365,581, an increase of 12.9 per cent above the same period in 1935, but a decrease of 28.8 per cent under the first ten months of 1930. Railroads in the Eastern district for October had a net of $45,307,472, compared with $37,420,639 in October, 1935, and $47,274,716 in October, 1930.

Class I railroads in the Southern district for ten months of 1936 had a net railway operating income of $62,339,537, at the rate of 2.34 per cent. For the same period in 1935, their net amounted to $42,793,228, at the rate of 1.59 per cent, and for the same period in 1930 it was $73,164,144 or 2.63 per cent. Operating revenues in the Southern district for ten months amounted to $408,686,498, an increase of 15.2 per cent compared with the same period in 1935, but a decrease of 25 per cent under the same period in 1930. Operating expenses totaled $306,421,757, an increase of 9.6 per cent above the same period in 1935, but a decrease of 28.5 per cent under 1930. Railroads in the Southern district for October had a net of $9,435,331, compared with $7,143,414 in October, 1935, and $10,146,795 in October, 1930.

Class I railroads in the Western district for ten months had a net of $151,651,392, at the rate of 1.67 per cent. For the same ten months in 1935, the railroads in that district had a net of $105,082,726, at the rate of 1.16 per cent, and for the same period in 1930 it was $297,420,898, or 3.21 per cent. Operating revenues in the Western district for ten months amounted to $1,238,707,803, an increase of 17.7 per cent above the same period in 1935, but a decrease of 28.3 per cent under the same period in 1930. Operating expenses totaled $940,026,835, an increase of 13.9 per cent compared with the same period in 1935, but a decrease of 25.2 per cent under the same period in 1930. For October, the railroads in the Western district reported a net of $35,108,606, compared with $30,890,448 for the same roads in October, 1935, and $53,501,838 for them in October, 1930.

Hudson Bay Rail Route Failure for Grain Export

Outlook dark for any movement of crop from Fort Churchill next season

Fort Churchill, Canada's farthest north railway grain terminal, and the Hudson Bay Railway are receiving a rough ride. Both the Conservative and the Liberal parties at Ottawa a few years ago engaged in a competition of voting for the Western vote and the result was that both of these parties became committed to building a railway outlet for grain in Hudson Bay. The Hudson Bay Railway was built at a cost of at least $60,000,000 and the terminal facilities, first began at Port Nelson and then moved farther north to Churchill, cost at least $10,000,000 more. In the six years of operation up to this fall a total of a little over 16,000,000 bushels of wheat has been moved out of Churchill by vessels to Europe.

Figuring the total cost of the grain route for Western growers at not less than $70,000,000, the cost per bushel of wheat actually moved up to date is $4, and this in spite of a highly efficient management and exceedingly generous marine insurance rates on boats which have to traverse Hudson Strait which is regarded as highly hazardous. Since the opening of the Hudson Bay Railway, however, two large mining properties, including Flin Flon, developed by the Whitney interests in northern Manitoba, have been put into operation and the road will profit from a steadily increasing traffic out of and into the mining properties, but as a grain route it seems doomed.

Recently Hon. C. D. Howe, Minister of Transport at Ottawa, set up the National Harbor Board in which is centralized the administration of seven national ports, six on the Atlantic side and the St. Lawrence river, and the seventh being Vancouver, which ports were previously controlled by seven separate and costly commissions. This month the national board will take over the administration of the port of Churchill which was built and managed under the supervision of the Department of Railways and Canals. In every winter up to now the 2,500,000-bushel elevator at Churchill has been filled with wheat for winter storage. This fall it contains only about 600,000 bushels and it is stated that the outlook for any grain movement out of that port next season (the navigation season up there is of not over seven weeks) is now very dark, due chiefly to this year's short crop.

Express Traffic Up

Express traffic in the United States showed an increase in October of 13.08 per cent over October, 1935, according to a recent survey by the Railway Express Agency. All of the agency's 16 operating departments showed gains ranging from 9.8 to 18.7 per cent. During October a total of 13,281,000 shipments was handled in both the rail express and the air express services of the Agency.

Ask I.C.C. to Establish Minimum Truck Charges

Illinois railroads raise interesting point in petition for re-opening of eastern storedoor case

The Illinois Freight Association railroads have raised an interesting point for the consideration of the Interstate Commerce Commission in a petition for a re-opening and re-hearing of the eastern pick-up and delivery case. Objecting to the commission's requirement in its order of October 13 in the eastern case that railroad pick-up and delivery service on less-than-carload freight be made subject to a minimum rate of 45 cents per 100 pounds the Illinois lines have asked the commission to enlarge the scope of the proceeding to determine what minimum rate, if any, should be established by motor vehicle operators in Official Classification territory on shipments accorded pick-up or delivery service by such operators. It would not be fair, they asserted, to impose a minimum on the railroads unless and until the commission has considered and determined whether a minimum rate should not be imposed on motor vehicle operators. "There is in our judgment," the petition says, "no doubt about this point and we cannot too strongly emphasize it."

The petition points out that the Illinois lines established pick-up and delivery service on January 20 subject to a minimum rate of 20 cents and that they believe the 45-cent rate prescribed by the commission for Official Classification territory to be unreasonably high. The commission is asked to postpone the effective date of its order pending further hearing and a determination by the commission of what minimum, if any, should be established.

On December 9 the commission announced an order postponing the effective date of its order from December 21 to January 21, 1937.

Defective Baggage Cars

The Bureau of Safety of the Interstate Commerce Commission, investigating a recent fatal collision in a large passenger-car yard, finds that hand brakes on baggage cars are not well maintained, and the report on the collision calls for remedial action.

The collision occurred at 4 p. m. on September 11. Five baggage cars were being pushed eastward on a descending grade when three of them broke loose and ran down some distance into collision with standing cars; one employee was killed and one injured. The air brakes were not in use and efforts to use hand brakes were unsuccessful. The inspector holds that in view of the grade and of the fact that there had been two break-in-twos already the air brakes should have been connected and in use. The use of power brakes is not required by law for such a movement, and employees testified that their use was not customary in this yard, except when moving dining cars. Inquiries concerning the condition of brakes generally, brought out the statement from one switchman that, during his 14 years' service in this yard, he had never had occasion to use hand brakes on mail or baggage cars though he had used them (and always with success) on passenger cars.

The government went on to inspect seven similar cars in the yard and found that on six of the seven the hand brakes could not be operated. Later the commission sent inspectors all over the country to examines passenger-train cars; and this inquiry was extended to the yards of 31 different carriers; 127 baggage, mail and express cars examined showed 48 per cent with inefficient hand brakes, and 99 passenger cars were 27 per cent inefficient.

The Bureau not only calls on the roads to give proper attention to this problem of inefficient brakes, but adds the suggestion that designs of hand brakes are not now in all cases adequate to present-day requirements.

Air Lines Report New Records for October

United States domestic scheduled air lines set all-time high records for the amount of express carried and number of passenger-miles, express pound-miles and passenger seat-miles during October, it was announced by the Bureau of Air Commerce, Department of Commerce. The 23 air lines operating during October reported that 799,266 pounds of express were carried—over 310,000 more than the poundage for October, 1935. Other records were the 44,411,139 passenger-miles, 425,456,139 express pound-miles, and 64,542,595 passenger seat-miles in October of this year.

A total of 102,917 passengers was carried, and 5,912,669 miles were flown in October of this year. Although these were not records, they represented increases over the previous month and the same month in 1935.

New Equipment Installed

Class I railroads in the first 10 months of 1936 placed in service 34,113 new freight cars, the largest number installed in any corresponding period since 1930, the Association of American Railroads has announced. This was an increase of 29,321 above the number installed in the corresponding period last year and an increase of 12,442 above the corresponding period in 1934. New cars installed in the 10 months' period this year included coal cars, 15,350; box cars, 14,621; refrigerator cars, 2,819, and 1,323 miscellaneous cars.

New locomotives placed in service in the first 10 months of this year included 73 steam and 27 electric and Diesel engines, compared with 31 steam and 102 electric locomotives installed in service in the same period of 1935, and 22 steam and 16 electric locomotives installed in service in the first 10 months of 1934.

Class I railroads had 14,068 new freight cars on order on November 1, this year, compared with 6,433 cars on November 1, 1935, and 3,080 cars on November 1, 1934.

New locomotives on order on November 1, this year, included 67 steam and 10 electric and Diesel engines, compared with 14 steam locomotives and three electrics on order on November 1, 1935, and 34 steam and 101 electric locomotives on order on November 1, 1934.

Roads at Junction Point When Congress Convenes

Transportation Conference says next session is likely to decide on future of private control

"American railroads are at the junction point, with the Congress which convenes next month likely to decide whether they are to remain under private control or to be forced, directly or indirectly, into government ownership and operation," declared the Transportation Conference in a statement issued in New York on December 8.

The railroads, the statement continues, expect the reintroduction of bills authorizing the government to acquire and run the roads, and they are also confronted with a drive by labor groups for a 30-hour week and other "make-work" measures.

"Meanwhile the roads are resolutely facing their problems of capital needs, refunding and repayment of debts; meeting huge and rising taxes; recouping some of their depression losses as traffic picks up with the business revival and improved rail service; adjusting fixed charges to earning power; rehabilitating their properties and rolling stock; working toward necessary reorganizations and consolidations; and, many of them, struggling with bankruptcy or the threat of insolvency. Not only is the future of rail transport at stake, but the formulation of a national transportation policy to include all forms of transport waits on the legislative developments affecting the railroads. The imminence of decisions on momentous issues affecting railroad and other transportation have thrust the subject into public consideration and discussion more actively than at any time since the War.

"There seems to be agreement that these essential factors are involved: (a) A national transportation problem of the first magnitude is presented; (b) formulation of a broad national transportation policy is imperative and long overdue; (c) the railroads are the key to sound and rounded transportation development; (d) the capital structure and requirements of the railroads are a problem of major importance.

"The aggregate of direct taxation on railroads, mostly of state and local variety, rose from $44,445,000 in 1900 to $402,698,000 in 1929, and has averaged $322,000,000 annually since that year. There is no way of judging whether these charges will increase, though it is evident that the tendency in this direction is marked. Heavy taxes are far from being the only financial problem confronting the carriers Any large increase in operating charges has a vital bearing on net income. Any industry which can not show a substantial net income is at a serious disadvantage in securing necessary capital for debt retirement or refunding and for expansion or improvements vitally important to all modern industries, and particularly so to the railroads.

"At present the possibility of large additions to operating charges face the rail-

roads, charges which will add nothing to their income, and are therefore straight additional expenses. One such charge arises from the Railway Retirement Act, which, if sustained by the courts, will add $57,000,000 to railroad payrolls annually. Another, the Social Security Act, calls for $32,000,000 in taxes for 1937, and $48,000,000 annually thereafter.

"Labor costs are another serious problem to the carriers. Organized railway labor, speaking through George M. Harrison, head of the Railway Labor Executives Association, has announced a drive for a 6-hour day for all railway workers, with no reduction in pay. The American Federation has declared for a 6-hour day in all industries. A 6-hour day bill for railroads was introduced into the last Congress and its cost has been carefully computed. On the basis of the 1934 traffic volume this one bill would mean a payroll jump of $366,000,000. As the traffic volume increases, this amount is swelled in proportion, as for example in 1930, a year in which the traffic volume was higher, the cost of this bill would have risen to $547,000,000. Viewing the picture from another angle, the sum required to put this bill into effect would swallow up about three-quarters of the net railway operating income, and would leave the carriers with funds far from sufficient to meet even the fixed charges of rentals and interest. These naturally must be met before stockholders can receive anything.

"The railroads during the depression had one of the finest records of any industry in their relations to labor. Furthermore, during the whole period service and safety were maintained to a remarkable extent. As the country emerged from the depression, improvements in both freight and passenger service have been among the most noticeable features of recovery.

"Nevertheless, almost a third of the carriers are in receiverships or reorganization, and another third have failed to meet fixed charges during two or more of the past six years, to say nothing of dividends to stockholders. If not burdened with further oppressive regulation or compulsory new expenditures, the roads can devote their energies to finding a way out of their difficulties. Unreasonable demands which call for huge additional charges against the carriers can only defeat attempts to solve their problems. And with their defeat inevitably follows ownership and operation by the government, which alone holds the power to tax the public at large in order to meet any resulting railway deficits. Moreover, as Mr. Thomas Lamont pertinently asked recently, 'if the government owns the railroads. . . . can it avoid going a step farther? Can it avoid taking over the whole transportation machinery?' He added that government ownership 'would not be my solution.' The Transportation Conference holds that government ownership would not solve the problem. It would merely transform the present difficulties, which face private management, into identical difficulties which would confront government management and which, as far as their fiscal nature is concerned, would become an additional burden to the general taxpayers.

New York Hours of Service Law for Motor Vehicle Operators

The state industrial commissioner of New York has begun the distribution of administrative regulations and sample trip sheet forms to be used for reports required by that state's labor law limiting the hours of operators of motor trucks and motor buses to not more than 10 hours in 14 to be followed by eight hours rest. The forms now being issued are merely samples since each bus and truck company must provide its own supplies of these trip sheets which the law requires shall be carried by all drivers after January 1, 1937.

New Siberian Line

Recent press dispatches from Moscow report that the Union of Soviet Socialist Republics has recently completed a new 2,000-mi. railway line across Siberia. Built for military as well as commercial purposes, the new line, the dispatches say, is called the Baikal-Amur Magister. It branches northward from the Trans-Siberian at Taishet, east of Lake Baikal and runs north of that lake to Komsomolsk, a new industrial city 125 miles north of the Manchukuoan border at Khabarovsk. At Komsomolsk the line divides into three branches—one, northward to Nicolaievsk, another westward to a new Asiatic port the U. S. S. R. is building, and the third southward to a connection with the Trans-Siberian at Khabarovsk.

Revised Contract for Pooling of Ore Traffic Approved

The Interstate Commerce Commission has approved a revised contract between the Chicago & North Western, the Escanaba, Iron Mountain & Western, and the trustees of the Chicago, Milwaukee, St. Paul & Pacific providing for the pooling of interstate ore traffic from the Menominee Range in Michigan and Wisconsin to Escanaba, Michigan, and of class and commodity traffic to and from points on the line of the Escanaba and Lake Superior, and the division of earnings therefrom. The commission has also authorized the abandonment by the Chicago, Milwaukee, St. Paul & Pacific of operation under trackage rights over the Escanaba & Lake Superior's line of railroad in Dickinson, Marquette, and Delta Counties, Michigan.

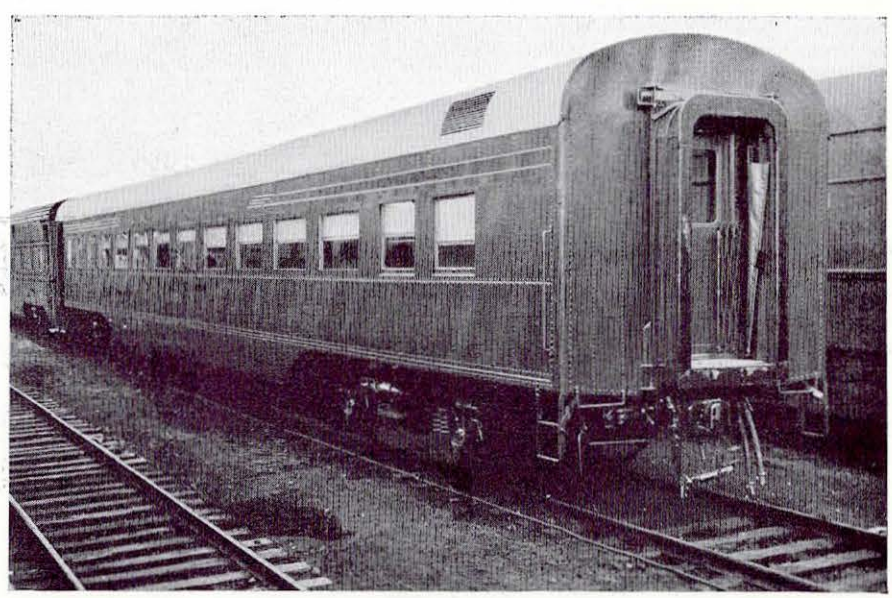
Lehigh Valley to Operate Its First Snow Trains

The Lehigh Valley will this winter operate its first snow trains, according to a recent announcement by N. W. Pringle, passenger traffic manager. The trains will go from New York to Hazleton, Pa., where, according to Mr. Pringle, plans are being carried out for the development of a new winter sports center. Ski trails, both for beginners and experts, have been constructed as well as toboggan slides and other winter sports facilities.

The announcement states that the snow trains, "with attractive low fares" will operate on frequent Sundays to this resort where "during the greater part of the Winter the snow is from 30 to 40 inches deep."

Santa Fe Tests Light-Weight Passenger Car

A light-weight, Corten steel, standard size passenger car was placed in service by the Atchison, Topeka & Santa Fe on December 3, between Kansas City, Mo., and Emporia, Kan., for test purposes. This coach seats 52 passengers, the remainder of the space being occupied by lounging rooms at each end. Each of these rooms has a toilet room, lavatory and dental fountain. At one end is a smoking and dressing room for women, furnished with a dressing table and individual chairs. At the opposite end of the car is a men's lounge and smoking room furnished with individual chairs with rubber-cushioned backs and seats. The walls in the main body of the car are finished in satinwood veneer. The widely spaced double seats, of the reclining type, are upholstered in a green frieze, with rubber cushions in



The Santa Fe's Light-Weight Passenger Car

the seats and backs. The car is equipped with steam-ejector-type air-conditioning, while greater riding comfort is provided through the use of hydraulic shock absorbers, rubber insulation, special wheel contour and unit mounted brake cylinders actuating clasp brakes. Thick layers of cork and insulation blanket on the floor sound-proof the interior of the car from truck noises. The car weighs 98,000 lb., compared with 160,000 lb. for a conventional Santa Fe car of this type.

Denial of Truck Certificate for Express Company Recommended

Joint Board No. 2 appointed by the Interstate Commerce Commission, has recommended in a proposed report that the commission deny an application of the Southeastern Express Company for a certificate authorizing it to operate as a common carrier of commodities generally by motor vehicle between Charlotte, N. C., and Columbia, S. C. The board found that "it clearly appears from the testimony that the traffic which applicant believes it would handle over the proposed truck line could move over existing lines as expeditiously and conveniently to the public as would be possible over the proposed line. In addition protestants showed by convincing testimony that this particular route is at present adequately, if not excessively served by motor carriers."

Trucking by Mercantile or Manufacturing Establishments

Numerous inquiries have been received by the Interstate Commerce Commission regarding the status under the motor Carrier act, of a mercantile or manufacturing establishment which engages in no transportation of property excepting property which is sold or purchased by it and which is transported from or to its established place of business as an incident to the conduct of such business, but for compensation received either directly or indirectly as an allowance in connection with the purchase price or otherwise. There has been no formal decision of the commission relative to its jurisdiction over such transportation, but, according to a notice issued on December 5, until such a formal decision has been made, or until further notice, the Commission will not require compliance with the general provisions of the Motor Carrier Act on the part of any mercantile or manufacturing establishment engaged in transportation as above described. However, they will, until such decision has been made, be subject to any regulations for private carriers by motor vehicle which the commission may hereafter prescribe under the authority of Section 204 of the act and which relate to qualifications and maximum hours of service of employees and safety of operation or standards of equipment.

British Road Claims Steam Speed Record

London to Scotland in less than six hours by train is now a reality, due to the recent record-breaking 401.2-mi. run from Glasgow to London in 5 hrs. 44 min. by "No. 703" of the London, Midland & Scottish, it was revealed in a statement issued this week by T. R. Dester of the Associated British Railways, New York. This time bettered the train's former performance of 5 hrs. 53 min. which was made on the run in the opposite direction.

The feature of these runs, the statement says, was that the engine and coaches were exactly the same as those used by the L. M. & S. on its regular express services. The locomotive "Princess Elizabeth," was not in any manner streamlined and even at 95 m.p.h., the train, consisting of seven coaches, did not give any sensation of excessive speed, Mr. Dester said.

The average speed for the 401.2 miles was 70 m.p.h. On the trip to Scotland, the train had averaged 68.2 m.p.h. Many steep gradients were negotiated and during the trip the engineer was forced to throttle down in order to pass through some fifty restricted areas where low speed limits were in force.

On the return journey from Glasgow, the engine hauled an additional 30 tons. Mr. Dester said that the six miles between Winsford Junction and Coppenhall were covered at an average of 90 m.p.h., with a top speed of 95 m.p.h. The train arrived at Euston after a 91 m.p.h. spurt from Tring.

Net Income of $42,789,982 Reported for Nine Months

A net income of $42,789,982 for the first nine months of this year was reported by the Class I railroads, according to the Interstate Commerce Commission's monthly compilation of selected income and balance-sheet items. This compares with a deficit of $66,180,281 for the corresponding period

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled from 138 Reports (Form IBS) Representing 144 Steam Railways

TOTALS FOR THE UNITED STATES (ALL REGIONS)

For month of September 1936	For month of September 1935	*Income Items*	For the nine months of 1936	For the nine months of 1935
$70,166,026	$57,349,263	1. Net railway operating income	$434,864,001	$321,201,770
11,877,019	11,844,577	2. Other income	107,184,793	113,760,887
82,043,045	69,193,840	3. Total income	542,048,794	434,962,657
2,338,602	1,254,228	4. Miscellaneous deductions from income	14,995,991	12,826,192
79,704,443	67,939,612	5. Income available for fixed charges	527,052,803	422,136,465
		6. Fixed charges:		
11,049,978	11,583,346	6-01. Rent for leased roads	100,481,865	100,696,999
41,015,570	41,505,434	6-02. Interest deductions	372,721,083	376,646,162
233,048	216,025	6-03. Other deductions	2,028,688	1,957,400
52,298,596	53,304,805	6-04. Total fixed charges	475,231,636	479,300,561
27,405,847	14,634,807	7. Income after fixed charges	51,821,167	§ 57,164,096
999,831	999,831	8. Contingent charges	9,031,185	9,016,185
26,406,016	13,634,976	9. Net income*	42,789,982	§ 66,180,281
		10. Depreciation (Way and structures, and Equipment)	145,140,542	146,287,646
16,078,842	16,238,103	11. Federal income taxes	19,502,668	12,856,261
2,199,170	1,945,900	12. Dividend appropriations:		
		12-01. On common stock	53,318,285	68,224,725
951,674	6,188,521	12-02. On preferred stock	17,228,407	12,601,111
§ 637	1,039,712			

Selected Asset Items	Balance at end of September 1936	Balance at end of September 1935
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$688,528,402	$735,303,581
14. Cash	$505,975,082	$398,106,478
15. Demand loans and deposits	14,447,651	14,032,671
16. Time drafts and deposits	40,668,235	32,526,047
17. Special deposits	147,209,550	64,392,059
18. Loans and bills receivable	2,349,257	4,095,933
19. Traffic and car-service balances receivable	61,233,841	56,404,613
20. Net balance receivable from agents and conductors	55,014,589	49,299,140
21. Miscellaneous accounts receivable	144,138,180	134,299,648
22. Materials and supplies	295,878,461	285,605,547
23. Interest and dividends receivable	27,803,975	33,458,228
24. Rents receivable	2,561,350	2,700,480
25. Other current assets	6,549,367	5,462,762
26. Total current assets (items 14 to 25)	$1,303,829,538	$1,080,383,606
Selected Liability Items		
27. Funded debt maturing within 6 months†	$158,852,956	$243,617,814
28. Loans and bills payable‡	$219,121,734	$344,232,829
29. Traffic and car-service balances payable	80,689,517	73,036,065
30. Audited accounts and wages payable	231,405,470	214,065,567
31. Miscellaneous accounts payable	106,216,085	59,923,342
32. Interest matured unpaid	522,238,769	395,181,194
33. Dividends matured unpaid	13,015,809	15,550,650
34. Funded debt matured unpaid	474,455,202	322,191,273
35. Unmatured dividends declared	1,144,223	1,185,783
36. Unmatured interest accrued	103,228,224	105,187,456
37. Unmatured rents accrued	31,947,185	31,771,782
38. Other current liabilities	25,876,603	17,778,965
39. Total current liabilities (items 28 to 38)	$1,809,338,821	$1,580,104,906
40. Tax liability (Account 771):		
40-01. U. S. Government taxes	$77,247,693	$33,052,519
40-02. Other than U. S. Government taxes	160,365,473	158,926,847

* The net income as reported includes charges of $1,458,054 for September, 1936, and $13,111,962 for the nine months of 1936 on account of accruals for excise taxes levied under the Social Security Act of 1935; also $3,888,118 for September, 1936, and $27,328,818 for the nine months of 1936 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. The net income for September, 1935, includes credits of $396,149 and for the nine months of 1935 credits of $7,361,639, on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

† Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

‡ Includes obligations which mature not more than 2 years after date of issue.

§ Deficit or other reverse items.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE $25,000,000

Name of railway	Net income after depreciation, For the 9 months of 1936	Net income after depreciation, For the 9 months of 1935	Net income before depreciation, For the 9 months of 1936	Net income before depreciation, For the 9 months of 1935
Alton R. R.	*$1,174,689	*$2,083,313	* $916,016	*$1,844,324
Atchison, Topeka & Santa Fe Ry. System§.	3,921,187	4,057,289	12,390,588	12,696,712
Atlantic Coast Line R. R.	1,062,262	* 1,476,618	2,653,260	205,639
Baltimore & Ohio R. R.	250,077	* 3,334,021	5,789,974	1,984,200
Boston & Maine R. R.	* 2,473,858	* 510,981	* 1,244,839	712,359
Central of Georgia Ry.†	* 1,789,210	* 1,887,262	* 1,211,905	* 1,271,941
Central R. R. of New Jersey	* 2,471,992	* 1,426,425	* 1,327,348	* 198,182
Chesapeake & Ohio Ry.	28,836,672	20,456,043	35,154,186	26,548,913
Chicago & Eastern Illinois Ry‡.	* 791,857	* 1,405,797	* 349,286	* 950,166
Chicago & North Western Ry.‡	*10,001,538	* 9,912,892	* 6,297,944	* 6,144,055
Chicago, Burlington & Quincy R. R.	1,768,528	* 2,402,926	5,207,107	1,074,148
Chicago Great Western R. R.‡	* 144,988	* 1,040,411	231,747	* 652,373
Chicago, Milwaukee, St. Paul & Pacific R. R.‡	*12,156,189	*16,376,964	* 8,131,757	*12,189,499
Chicago, Rock Island & Pacific Ry.‡	*11,573,007	*11,781,295	* 8,359,688	* 8,471,437
Chicago, St. Paul, Minneapolis & Omaha Ry.	* 1,504,602	* 2,034,060	* 1,057,660	* 1,565,155
Delaware & Hudson R. R.	* 1,237,417	* 1,942,003	* 412,769	* 1,162,567
Delaware, Lackawanna & Western R. R.	* 931,157	* 2,797,944	1,070,351	* 773,701
Denver & Rio Grande Western R. R.‡	* 3,929,041	* 3,531,730	* 3,063,811	* 2,635,327
Elgin, Joliet & Eastern Ry.	1,053,227	878,581	1,726,791	1,545,821
Erie R. R. (including Chicago & Erie R. R.)	896,965	* 1,659,346	3,811,314	1,335,659
Grand Trunk Western R. R.	* 116,232	* 549,817	725,995	256,771
Great Northern Ry.	3,209,176	1,425,435	5,960,980	4,156,544
Illinois Central R. R.	* 2,498,055	* 3,825,207	2,409,574	1,194,908
Lehigh Valley R. R.	691,263	* 2,068,272	2,412,265	* 309,863
Long Island R. R.	* 464,529	* 844,739	409,856	52,714
Louisville & Nashville R. R.	6,047,696	2,369,703	9,182,912	5,562,400
Minneapolis, St. Paul & Sault Ste. Marie Ry.	* 4,357,168	* 4,436,771	* 3,440,612	* 3,577,952
Missouri-Kansas-Texas Lines	* 1,197,234	* 3,173,502	* 233,559	* 2,201,397
Missouri Pacific R. R.‡	* 7,517,692	*12,295,998	* 4,365,972	* 9,124,228
New York Central R. R.¶	3,501,306	* 6,385,081	15,648,434	6,094,132
New York, Chicago & St. Louis R. R.	1,982,889	148,414	3,140,893	1,367,693
New York, New Haven & Hartford R. R.‡.	* 4,814,937	* 2,618,872	* 2,235,000	* 109,138
Norfolk & Western Ry.	22,529,713	16,540,778	25,911,886	19,919,308
Northern Pacific Ry.	* 4,100,471	* 6,395,741	* 1,738,519	* 4,002,427
Pennsylvania R. R.	23,977,971	14,944,772	40,439,621	31,345,539
Pere Marquette Ry.	1,298,374	417,642	3,197,959	2,346,647
Pittsburgh & Lake Erie R. R.	3,367,553	2,341,261	4,720,778	3,702,525
Reading Co.	4,482,915	3,224,483	6,866,279	5,533,135
St. Louis-San Francisco Ry.‡	* 5,770,601	* 8,408,417	* 3,356,876	* 6,043,679
St. Louis Southwestern Lines‡	* 254,952	* 598,913	199,144	* 134,183
Seaboard Air Line Ry†	* 5,115,780	* 5,646,653	* 3,704,830	* 4,241,045
Southern Ry.	1,640,832	* 2,975,278	4,076,679	* 717,190
Southern Pacific Transportation System‖	5,040,589	* 2,046,776	10,910,982	3,696,618
Texas & Pacific Ry.	1,044,191	582,908	1,919,549	1,488,009
Union Pacific R. R.	9,684,538	8,658,527	14,530,858	13,473,312
Wabash Ry.†	* 1,946,295	* 2,508,145	* 347,725	* 884,260
Yazoo & Mississippi Valley R. R.	* 30,496	* 1,124,395	362,016	* 731,104

† Report of receiver or receivers.

‡ Report of trustee or trustees.

§ Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.

¶ Includes Boston & Albany, lessor to New York Central R. R.

‖ Includes Southern Pacific Company and Texas and New Orleans R. R. The operation of all separately operated solely controlled affiliated companies, resulted in a net deficit of $2,585,270 for nine months of 1936 and $2,989,964 for nine months of 1935. These figures are not reflected in this statement.

* Deficit.

of last year. For September the net income was $26,406,016, as compared with $13,364,976 for September, 1935. For September 73 roads reported a net income while 62 had net deficits and for the nine months period 62 roads reported a net income while 73 had deficits. Last year for nine months only 47 roads reported a net income. The consolidated statement and a statement of the net income of the roads having annual operating revenues above $25,000,000 are given in the accompanying tables.

Long Island Sponsors Essay Contest for High School Seniors

Students in senior classes of Long Island high schools, located in Nassau and Suffolk counties, have been invited to participate in an essay contest to be conducted by the Long Island. Cash prizes of $40 each will be awarded by the railroad management to the successful boy and girl contestants.

The essay contest was suggested by George Le Boutillier, vice-president of the Long Island, when he learned that increasingly greater interest is being shown by high school principals and students in the Easter holiday trips to the nation's capital in Washington. It was Mr. Le Boutillier's thought that the money prizes offered might be used by the winners to defray practically all expenses connected with the personally-conducted Easter tours sponsored by the Long Island and Pennsylvania. There are however no restrictions as to the use made of the prize money.

I.C.C. Valuing Pipe Line Companies

The Interstate Commerce Commission on November 30 began serving tentative valuation reports on oil pipe line companies. Under the law, tentative valuations become final if no protest is filed within 30 days. Service is made on specified federal and state officials and commissions as representing public interest as well as on the carrier under valuation. The first of these tentative valuations is on the Atlantic Pipe Line Company, which owns 979 miles and uses 972 miles of trunk lines and owns 375 miles and uses 374 miles of gathering lines, a total of approximately 1,350 miles of pipe lines in Texas and New Mexico. All facilities used in transportation, from pumping stations to tank farms, are included in the valuation. Fifty-five companies, classified as interstate common carriers of oil and petroleum products by pipe line, have been inventoried and audited and are in process of valuation. Separate reports will be issued on each of them.

Dr. Rudolph Diesel Honored

Approximately 300 business leaders met at a luncheon at the Palmer House, Chicago, on December 7, to honor the memory of Dr. Rudolph Diesel, German inventor of the engine bearing his name, and to celebrate the fortieth anniversary of the entrance of Diesel power into the United States. Among the speakers were: E. E. Brown, president of the First National Bank of Chicago; Col. Robert H. Morse, president of Fairbanks, Morse & Company; C. D. Wiman, president of Deere & Company; Clarence Randell, vice-president of the Inland Steel Company; Samuel O. Dunn, editor of the *Railway Age;* B. C. Heacock, president of the Caterpillar Tractor Company, who was the host; C. L. Cummins, president of the Cummins Engine Company; E. C. Snyder, editor of the Corn Belt Dailies; O. F. Rost, field editor of Business Week; and Dr. George Michell.

Supply Trade

C. W. Merriken has been appointed director of sales of the asphalt division of the **Continental Paint & Varnish Company,** Chicago.

The American Rolling Mill Company, Middletown, Ohio, has started work on a new modern research laboratory at Middletown, to cost $260,000. The Austin Company are the contractors. The laboratory will replace the building destroyed by an explosion in December, 1935.

At a meeting of the board of directors of the **Timken Roller Bearing Company,** Canton, Ohio, on December 5, **Frederick J. Griffiths** resigned as a director and as president and director of its wholly-owned subsidiary, the **Timken Steel & Tube Company. William E. Umstattd,** president of the parent company, was elected also president of the subsidiary and **H. H. Timken, Jr.,** previously a vice-president of the Timken Steel & Tube Company, was made its executive vice-president, in addition to his present capacity as vice-president and director of the Timken Roller Bearing Company. **W. Robert Timken** was elected director of both companies to fill Mr. Griffiths' unexpired terms, and **John E. Fick** was appointed general superintendent of the steel and tube mills, succeeding **K. B. Bowman,** resigned.

OBITUARY

E. B. Entwisle, who retired as chief engineer of the Lorain Steel Company on October 1, 1929, after 44 years service with that company and its predecessor, the Johnson Steel Street Rail Company, died in Pittsburgh, Pa., on November 28 of a heart ailment.

Equipment and Supplies

Southern Pacific Launches $16,500,000 Equipment Program

The Southern Pacific has announced plans for the construction and rebuilding of passenger, freight and motive power equipment to cost more than $16,500,000, bringing the company's total appropriation for new and modernized cars and locomotives during the last 12 months to over $41,000,000.

The latest appropriation provides for the expenditure of nearly $15,000,000 for new rolling stock and motive power and includes the following items: 28 new steam locomotives—14 to be streamlined and designed for passenger service; 2,725 new freight cars, including 1,175 automobile cars; 41 new passenger cars—all of modern light-weight type. Air-conditioning and modernization of passenger-train equipment will cost $1,200,000.

In addition to the $41,000,000 for cars and locomotives other items have been authorized including the purchase of rails and fastenings totaling $5,890,000.

Details of orders for some of this equipment are reported elsewhere in these columns.

LOCOMOTIVES

THE SOUTHERN PACIFIC has ordered 28 locomotives—14 freight locomotives of the 4-8-8-2 type from the Baldwin Locomotive Works, and 14 streamlined passenger locomotives from the Lima Locomotive Works.

FREIGHT CARS

THE READING will build 25 new all-steel caboose cars in its Reading, Pa., shops.

THE CHICAGO & NORTH WESTERN is inquiring for 500 fifty-ton automobile cars.

THE BALTIMORE & OHIO is making informal inquiries for prices on 1,500 gondola cars.

THE DELAWARE & HUDSON will build 60 hopper cars of 55 tons' capacity, and plans to build later 100 box cars of 40 tons' capacity, in its own shops.

THE NEW YORK, NEW HAVEN & HARTFORD will build 150 low side coal cars at its Readville, Mass., shops and will purchase 75 additional flat cars.

THE WESTERN PACIFIC has ordered 50 flat cars of 50 tons' capacity from the Pacific Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of October 24.

THE CHESAPEAKE & OHIO has placed orders for 2,000 freight cars as follows: American Car & Foundry Company, 500 gondola cars and 500 hopper cars; General American Transportation Corporation, 500 box cars; Pullman-Standard Car Manufacturing Company, 500 hopper cars. Inquiry for this equipment was reported in the *Railway Age* of November 21.

THE SOUTHERN PACIFIC has placed orders for 2,175 freight cars including 1,000 box and 1,175 auto box cars. The American Car & Foundry Company, the Pullman-Standard Car Manufacturing Company, the Pressed Steel Car Company, and the Bethlehem Steel Company, each received orders for 250 box cars. The General American Transportation Corp., received orders for 825 auto box cars, and the Mt. Vernon Car Manufacturing Company for 350 auto box cars.

PASSENGER CARS

THE CHICAGO & NORTH WESTERN is inquiring for 23 Challenger type coaches.

THE BANGOR & AROOSTOOK has received bids on five light weight deluxe coach and buffet cars and two baggage-mail cars.

THE RICHMOND, FREDERICKSBURG & POTOMAC is asking for bids on six baggage-express cars, 70 ft. long.

THE CENTRAL OF GEORGIA is looking into the matter of buying five passenger train cars and two express cars, but has not reached any definite conclusion as to purchasing.

THE GULF, MOBILE & NORTHERN has ordered one high speed, light weight streamlined, power-mail-baggage car and two light weight, streamlined trailer coaches, from the American Car & Foundry Company. This company was reported in the *Railway Age* of November 14 as having under consideration the question of buying a streamlined train.

IRON AND STEEL

THE CENTRAL OF NEW JERSEY has ordered 2,000 tons of rail.

THE READING has ordered 5,000 tons of rail.

THE NEW YORK CENTRAL—Bids have been received for about 1,250 tons of steel, for grade crossing elimination work at Little Falls, N. Y.

THE GRAND TRUNK WESTERN has ordered 5,000 tons of rails, for main-line replacements between Chicago and Port Huron, placing 1,500 tons with the Inland Steel Company and 3,500 tons with the Carnegie-Illinois Steel Corp.

MACHINERY AND TOOLS

THE NEW YORK, NEW HAVEN & HARTFORD, has ordered a 90-in. driving wheel lathe from William Sellers & Co., Inc.

TRADE PUBLICATION

PLATFORM TRUCKS.—A four-page illustrated booklet describing high-lift platform trucks, with illustrations showing typical applications of the basic machine to various industries by the use of correct attachments has been issued by the Elwell-Parker Electric Company, Cleveland, Ohio.

Financial

ATCHISON, TOPEKA, & SANTA FE—DENVER & RIO GRANDE WESTERN.—*Joint Use of Trackage.*—These roads have applied to the Interstate Commerce Commission for permission to operate jointly over each other's lines from South Denver to Bragdon, Colo., a distance of 104.95 miles of Atchison, Topeka & Santa Fe track and 102.93 miles of Denver & Rio Grande Western. These roads propose to use these lines as double track.

BALTIMORE & OHIO.—*Refunding Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this Company to issue $1,892,000 of refunding and general mortgage 6 per cent bonds, maturing April 1, 2000, upon deposit of the same amount of Toledo-Cincinnati division first lien and refunding mortgage 6 per cent bonds, all or any part to be pledged and repledged from time to time to and including December 31, 1938. The commission has also authorized the issuance of $1,892,000 of Toledo-Cincinnati division first lien and refunding 6 per cent mortgage bonds upon deposit with the trustees of the same amount of second mortgage 4½ per cent 50-year gold bonds of the Cincinnati, Hamilton & Dayton at par, to be used in retiring the Cincinnati, Hamilton & Dayton's Toledo-Cincinnati division first lien and refunding mortgage bonds.

BANGOR & AROOSTOOK.—*Redemption Notice.*—This company has given formal notice that its entire issue of 7 per cent preferred stock (34,800 shares, $100 par) has been called for redemption January 1 at 110.

CHESAPEAKE & OHIO.—*Preference Stock.*—The Interstate Commerce Commission, Division 4, has authorized this company to issue $15,315,500 of 4 per cent preference stock, consisting of 153,155 shares of a par value of $100, and necessary scrip certificates to be distributed pro rata as a dividend to the common stockholders.

CHICAGO, ROCK ISLAND & PACIFIC.—*Truck Lease.*—This company has applied to the Interstate Commerce Commission for permission to lease the A & A Truck Lines, operating from Hutchinson, Kan., to Dodge City, for 2½ years with an option to purchase the company for $20,000 at any time prior to May 1, 1941. The railroad proposes to substitute truck service for train service on l.c.l. freight.

ELGIN, JOLIET, & EASTERN—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its Coal City Branch in Grundy County, Ill., 7.31 miles. The operation on this line has already been abandoned, and the company proposes to now remove the physical equipment.

ILLINOIS CENTRAL.—*Notes.*—The Interstate Commerce Commission, Division 4, has authorized nine subsidiaries of this company to issue a total of $26,440,000 of 4 per cent demand notes which the Illi-

nois Central proposes to deposit with the Reconstruction Finance Corporation as collateral for a loan of $10,000,000 to be used in part to retire obligations maturing May 31, 1937. The notes represent expenditures made by the I. C. on the properties of the subsidiaries.

KANSAS, OKLAHOMA, & GULF—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue, sell, or pledge $422,000 first mortgage 5 per cent, Series 1978, gold bonds, to be sold to net the company not less than 102, making a rate of not more than 4.90. This issue is now selling at 104 and is an addition to $4,352,000 of the same series.

LEHIGH & NEW ENGLAND.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a line extending from Quarry Junction, Pa., to Bangor, 3.7 miles.

LEHIGH VALLEY.—*Bonds.*—The Interstate Commerce Commission, Division 4, has issued an order modifying its order of January 30, 1934, authorizing the issuance by this company of 4 per cent collateral notes, providing for an amendment eliminating the company's right of redemption.

LIME ROCK—*Abandonment.*—The Interstate Commerce Commission has authorized the abandonment of this company's line extending from a connection with the Maine Central in a northerly direction to Tillson Wharf and Crockett's Point, all in Knox County, Maine, 1.53 miles.

MAINE CENTRAL.—*Acquisition.*—The Interstate Commerce Commission, Division 4, has authorized the acquisition by the Maine Central of the Dexter & Piscataquis by purchase of the capital stock.

NEW YORK CENTRAL.—*Abandonment.*—Examiner C. P. Howard of the Interstate Commerce Commission in a proposed report has recommended that this company be permitted to abandon a line extending from Tupper Lake Junction to Helena, N. Y., 62.6 miles. The examiner has also recommended that this company continue operation, under trackage rights, over the line operated by the Canadian National from Massena to Helena, N. Y.

NORFOLK SOUTHERN.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $60,000 equipment trust certificates, Series A, to mature in 1945. They will be deposited with the Public Works Administration as security for a loan, the proceeds of which will be used as part payment on 25 new automobile box cars.

NORFOLK SOUTHERN.—*Abandonment.*—Examiner W. J. Schutrumpf of the Interstate Commerce Commission has recommended in a proposed report that the commission find that public convenience and necessity have not been shown to permit the abandonment of part of a branch line from Pungo, Va., to Munden, 10.2 miles, but suggested that the applicant may be permitted to operate this line only during the potato shipping season and abandon service during the rest of the year.

NORFOLK SOUTHERN BUS CORPORATION.—*Certificate Recommended.*—Joint Board No. 7, appointed by the Interstate Commerce Commission, has recommended in a proposed report that the Commission issue a certificate authorizing this line to continue operation as a common carrier in interstate commerce between Norfolk and Virginia Beach, Va.; between Norfolk and Munden Point, Va.; between Chesapeake Junction and Willoughby Spit, Va.; between Diamond Springs and Little Creek, Va.; between Norfolk, Va. and Elizabeth City, N. C.; between Elizabeth City and Washington, N. C.; also charter operations between points on applicant's lines on the one hand and points in Virginia, North Carolina, South Carolina, Florida, and the District of Columbia on the other. This authority is recommended pursuant to the "grandfather" clause of Section 206 (a) of the motor carrier act of 1935.

PENNSYLVANIA.—*Long Island Bonds.*—Kuhn, Loeb & Co., subject to the approval of the Interstate Commerce Commission, have offered $10,000,000 of 4 per cent refunding mortgage bonds of the Long Island due 1949, priced at 105½ to yield 3.44 per cent. The issue, which is guaranteed by the Pennsylvania, was acquired by the underwriters at 103¾.

PENNSYLVANIA-GRAND TRUNK WESTERN—*Joint Operation.* — The Interstate Commerce Commission, Division 4, has issued orders authorizing (a) the Pennsylvania to operate across Lake Michigan between Muskegon and Grand Haven, Mich., and Milwaukee, Wis., by joint use with the Grand Trunk Western of car ferries of the Grand Trunk Milwaukee Car Ferry, and to operate, under trackage rights, over tracks of the Grand Trunk Western in Milwaukee County, Wis., and of the Grand Trunk Western and the Muskegon Railway & Navigation in Muskegon County, Mich.; (b) the Muskegon Railway & Navigation to operate, under trackage rights, over tracks of the Pennsylvania in Muskegon County, Mich., and (c) the Grand Trunk Western to operate, under trackage rights, over tracks of the Pennsylvania and the Muskegon Railway & Navigation in Muskegon County, Mich.; (2) dismissing parts of applications of the Pennsylvania and the Grand Trunk Western for authority to operate, by car ferry, between Muskegon, Mich., and Manitowoc, Wis.; and (3) dismissing applications of the Grand Trunk-Pennsylvania Transportation Company for authority to operate, by car ferry, and of the Pennsylvania and the Grand Trunk Western for authority to acquire control of the Grand Trunk-Pennsylvania Transportation Company, by purchase of stock and lease; and (4) canceling certificate dated July 6, 1933, F.D. No. 9112.

SANTA FE TRAIL STAGES.—*Bus Permit Application.*—This company has applied to the Interstate Commerce Commission for authority to acquire the certificate and equipment of the Lee Way Stages, which operates a bus line from Raton, N. M., to Amarillo, Texas. The price to be paid is $25,000.

SOUTHERN PACIFIC.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to purchase a branch of the Visalia Electric, extending from Chouchilla, Calif., to Dairyland, 10.2 miles; price, $104,844.

Average Prices of Stocks and of Bonds

	Dec. 8	Last week	Last year
Average price of 20 representative railway stocks..	54.93	55.23	42.10
Average price of 20 representative railway bonds..	83.62	83.46	75.98

Dividends Declared

Alabama Great Southern.—Ordinary, 3 per cent; Ordinary, Extra, 4 per cent, both payable December 26 to holders of record December 11. Preferred, 3 per cent, payable February 17 to holders of record January 6; Preferred, Extra, 4 per cent, payable December 26 to holders of record December 11.

Bangor & Aroostook.—7 Per Cent Preferred, $1.75, payable January 1 to holders of record November 25.

Chicago, Burlington & Quincy.—Common, $4.00, payable December 18 to holders of record December 11.

Delaware R. R.—$1.00, semi-annually, payable January 2 to holders of record December 15.

Detroit, Hillsdale & Southwestern.—$2.00, semi-annually, payable January 5 to holders of record December 19.

Lackawanna R. R. of New Jersey.—4 Per Cent Guaranteed, $1.00, quarterly, payable January 2 to holders of record December 4.

Mahoning Coal R. R.—Common, $13.00, payable December 23 to holders of record December 14.

New York & Harlem River.—$2.50, semi-annually; Preferred, $2.50, semi-annually, both payable January 2 to holders of record December 15.

Pittsburgh & Lake Erie.—Common, $1.50, payable December 23 to holders of record December 14.

St. Louis, Rocky Mountain & Pacific.—25c; Extra, $1.00; Preferred, $1.25, quarterly, all payable December 31 to holders of record December 15.

Construction

CITY OF ST. LOUIS, MO.—The Board of Public Service of the City of St. Louis, Mo., has awarded a contract to the List & Weatherly Construction Company, Kansas City, Mo., for the construction of the railroad deck on the St. Louis Municipal bridge across the Mississippi river and the railroad approaches thereto. The bid of the List & Weatherly concern on this job was $206,110.

MISSOURI PACIFIC.—A contract has been awarded by this company to Fairbanks, Morse & Company, Chicago, for furnishing conveyor type coal handling equipment for installation at Atchison, Kan., in connection with a coaling station which is being constructed at that point.

NEW YORK CENTRAL.—The New York Public Service Commission has approved a low bid of the Walsh Construction Company, Syracuse, N. Y., of $101,918 for the elimination of the Weedsport road crossing of this road on the Weedsport-Cato county highway in the Town of Brutus, N. Y. The commission directed the company to award the necessary contract and begin the work as soon as practicable.

Railway Officers

EXECUTIVE

Thomas H. Pindell, general manager of the Alton & Southern, with headquarters at East St. Louis, Ill., has been elected president, to succeed **C. B. Fox.**

OPERATING

J. A. McNeill has been appointed special representative of the general manager of the Atchison, Topeka and Santa Fe, Coast Lines, with headquarters at Los Angeles, Cal., to succeed **T. L. Roberts,** deceased.

J. P. Kirkpatrick, assistant superintendent on the Canadian National, with headquarters at Sioux Lookout, Ont., has been transferred to the Kamloops division, with headquarters at Kamloops, B. C., to succeed **J. W. Crane,** who has been appointed superintendent of transportation of the Manitoba district at Winnipeg, Man. **J. H. McKinnon,** superintendent at Prince Albert, Sak., has been transferred in the same capacity to Calgary, Alta., succeeding **J. P. Johnson,** who has been appointed general superintendent at North Bay, Ont. **N. P. North,** superintendent of transportation at Winnipeg, has been appointed superintendent at Prince Albert. **G. A. Glay** has been appointed assistant superintendent at Sioux Lookout.

F. S. Risley, division superintendent on the New York Central, with headquarters at Albany, N. Y., has been appointed assistant general manager, Lines Buffalo and East, with headquarters at Syracuse, N. Y. **W. H. Wood,** division superintendent, with headquarters at Rochester, N. Y., has been appointed superintendent of the Mohawk and Hudson divisions, with headquarters at Albany. **C. A. Raymonda,** assistant superintendent of the Syracuse division at Syracuse, has been appointed superintendent of the Rochester division,

Fred S. Risley

with headquarters at Rochester. **J. B. Delaney** has been appointed assistant superintendent of the Syracuse division, succeeding Mr. Raymonda. Mr. Risley was born on September 6, 1879, at Kingston, N. Y., and after attending high school, entered railroad service on January 1, 1898, as an operator on the River division of the West Shore (now New York Central). He served subsequently as wire chief, dispatcher, assistant trainmaster and trainmaster. In April, 1910, he was appointed trainmaster of the Mohawk division at Albany, N. Y., and in September, 1913, became assistant superintendent of that division, with the same headquarters. Mr. Risley was appointed superintendent of the Buffalo division in April, 1924, and in October of that year he was transferred in the same capacity to the Syracuse division. He became general superintendent at Albany in January, 1927, and was appointed division superintendent in October, 1931, which position he held until his recent appointment as assistant general manager.

C. H. Tabor, whose appointment as superintendent of the Pocahontas division of the Norfolk & Western, with headquarters at Bluefield, W. Va., was noted in the *Railway Age* of December 5, entered the service of the Norfolk & West-

C. H. Tabor

ern on May 1, 1907, as a water boy on the Pocahontas division. Two years later he was promoted to timekeeper, and on November 1, 1911, he was made yard clerk at Wilcoe, W. Va. On April 20, 1917, he was promoted to assistant yardmaster at Wilcoe. Following two years of overseas service during the World War, he returned to the Norfolk & Western in July, 1919, as yardmaster at Iager, W. Va. He was appointed general yardmaster at Wilcoe in February, 1925, and continued in that capacity for two years; then he was promoted to assistant trainmaster of the Pocahontas division. He became terminal trainmaster at Bluefield in 1933 and was promoted to trainmaster of the Pocahontas division on October 1, 1934. Several months ago, he was given the same position on the Scioto division, which position he held until his recent appointment.

TRAFFIC

W. O. Parker, commercial agent on the Louisville & Nashville at Indianapolis, Ind., has been promoted to general agent, with headquarters at Louisville, Ky., to succeed **J. K. Williams,** who has been transferred to Detroit, Mich., to succeed **L. G. Parsons,** deceased.

Stanley A. Temple, supervisor of road, Toledo division of the Baltimore & Ohio, with headquarters at Lima, Ohio, has been appointed industrial engineer, with headquarters at Baltimore, Md.

The Agricultural department of the Baltimore & Ohio, which was formerly a section of the Commercial Development department, has recently been expanded and given independent status. **O. K. Quivey,** general agricultural agent at Baltimore, Md., has been appointed manager of agricultural development, with jurisdiction over both the Baltimore & Ohio and the Alton. Mr. Quivey will have two assistants, **A. F. Stevens,** agricultural agent for the Alton at Chicago, Ill., and **L. S. Hartley,** agricultural agent for the Baltimore & Ohio at Morgantown, W. Va. Mr. Quivey was graduated from Purdue University in 1917 and entered the service of the B. & O. as agricultural agent, in April of the same year. Later in 1917 he was appointed chief of the agricultural bureau of the Baltimore & Ohio. He was connected with the Sanitary Corps during the World War and then became agricultural commissioner of the Kansas City (Mo.) Chamber of Commerce. Mr. Quivey was appointed general agricultural agent for the B. & O. in 1921, the position he held until his recent appointment.

MECHANICAL

B. M. Brown, chief assistant superintendent of motive power and equipment on the Southern Pacific Lines in Texas and Louisiana, with headquarters at Houston, Tex., effective November 15, was promoted to assistant general superintendent of motive power of the Southern Pacific, with headquarters at San Francisco, Cal. The position of chief assistant superintendent of motive power and equipment at Houston has been abolished.

E. L. Bachman, master mechanic of the Philadelphia division of the Pennsylvania, with headquarters at Harrisburg, Pa., has been appointed general superin-

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E. L. Bachman

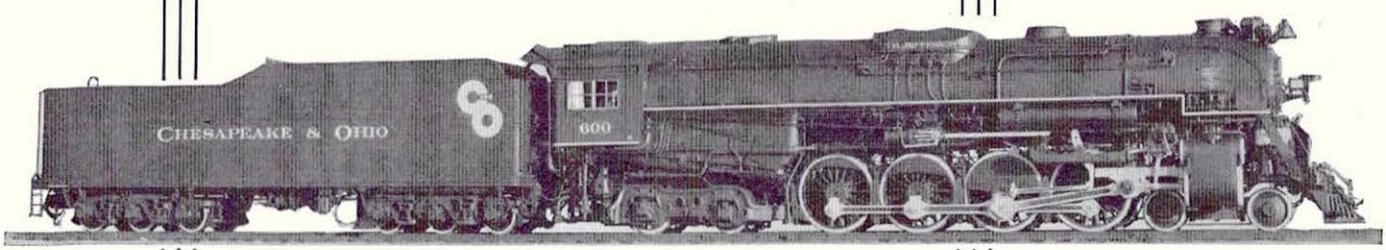
tendent of motive power of the New York zone, as announced in the *Railway Age*

Continued on next left-hand page

POWER . . .

To increase your ton-miles per hour you must increase the horsepower of your locomotives. » » How can you do it? » » Only by a combination of high boiler pressure, high superheat, generous boiler proportions, large grates, proper steam distribution, light reciprocating and rotating weights. » » This combination can only be obtained in

new locomotives!



LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

LIMA
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of December 5 in which a biographical sketch of Mr. Bachman's railway career was published.

Alexander K. Galloway, whose appointment as superintendent of motive power and rolling equipment of the Reading and the Central of New Jersey, with headquarters at Reading, Pa., was noted in the *Railway Age* of December 5, was born on October 1, 1885, at St. Thomas,

A. K. Galloway

Ont. He entered the service of the Baltimore & Ohio on November 1, 1914, as master mechanic on the Baltimore division and in July, 1916, he was appointed district master mechanic of the Northwest district, being transferred in the same capacity to the Maryland district in February, 1917. Mr. Galloway served in the latter position until April, 1927, when he was appointed superintendent motive power of the Western lines of the Baltimore & Ohio, with headquarters at Cincinnati, Ohio, and subsequently he was transferred in the same capacity to the Eastern lines, with headquarters at Baltimore, Md., the position he held until his recent appointment as superintendent of motive power and rolling equipment of the Reading and the Central of New Jersey.

PURCHASES AND STORES

R. G. Becker, division storekeeper on the Northern Pacific at Glendive, Mont., has been appointed district storekeeper at the Como store, St. Paul, Minn., to succeed **A. C. Johnson,** who has been transferred to South Tacoma, Wash., replacing **H. A. Humes,** deceased. **C. F. McNeal,** local storekeeper at Auburn, Wash., has been appointed division storekeeper at Glendive, to succeed Mr. Becker.

MOTOR TRANSPORT

George T. Hurst, assistant general freight agent of the Atchison, Topeka & Santa Fe, with headquarters at San Francisco, Calif., has been appointed traffic manager of the Santa Fe Transportation Company, with the same headquarters.

OBITUARY

Richard D. Cronly, Sr., who retired in 1933 as assistant to the president of the Atlantic Coast Line, died on November 29 at Wilmington, N. C. He was 73 years old.

George Z. Phillips, general passenger agent for the Seaboard Air Line, with headquarters at Jacksonville, Fla., died suddenly on December 6 at his home in that city. He was 58 years old.

Albert T. Perkins, formerly a division superintendent on the Chicago, Burlington & Quincy and who occupied executive positions on various other lines, died at St. Louis, Mo., on November 23. Mr. Perkins was born on October 2, 1865, at Brunswick, Me., and graduated from Harvard University in 1887. In October of the same year he entered railway service with the Chicago, Burlington & Quincy as a clerk in the general freight office at Chicago, later serving as chief clerk in the contracting agent's office at the same point, as traveling freight agent, as chief clerk in the general freight office at St. Louis, as general agent at Hannibal, Mo., and as local freight agent at St. Louis. In January, 1897, he was promoted to superintendent of the freight terminals at St. Louis, and two years later he was made superintendent of terminals at the same point. In June, 1902, Mr. Perkins became superintendent of the St. Joseph division, holding this position until April, 1906, when he became railroad adviser and consulting engineer to the Municipal Bridge & Terminals Commission of St. Louis. In March, 1909, Mr. Perkins became president of the Chicago, Milwaukee & Gary (now part of the Chicago, Milwaukee, St. Paul & Pacific), which position he held until May, 1922. Later he became president of the Apalachicola Northern, holding this position until 1932, when he retired. For several years Mr. Perkins was also president of the Marshall & East Texas (now Marshall, Elysian Fields & Southeastern), president of the New Iberia & Northern (now part of the Gulf Coast Lines), and first vice-president of the St. Louis Brownsville & Mexico (now also part of the G. C. L.).

William Cunningham, chief interchange inspector of the Detroit Car Interchange Inspection Association, died on November 5 at the age of 71 years. Prior to entering the service of the Detroit Car Interchange Inspection Association in 1915, Mr. Cunningham had served 5 years with the Pere Marquette and about 26 years with the Michigan Central, having entered the service of the latter company at the age of 19.

* * * *

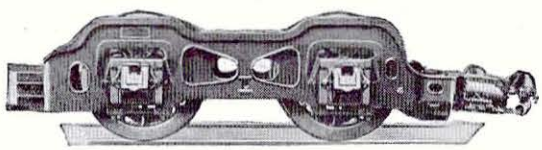
A Missouri-Kansas-Texas Banana Train Leaving Galveston, Texas, for Southwest Points

Tables of Revenues and Expenses of Railways begin on next left-hand page

"Safe and Sound Sleep!"

[THANKS TO THE BOOSTER]

When the train sings a lullaby—smooth, rhythmic movement—smooth, effortless starts and stops—how comfortable rail travel can be—and how safe. With both mother and the little ones rested and happy, is there any wonder they tell about it—and show it, too. » » » Booster locomotives make smooth, effortless starts from every stop. They make the passengers boosters for rail travel.



FRANKLIN RAILWAY SUPPLY CO., INC. NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1936

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1936	1935	Before depr. & ret.
Akron, Canton & Youngstown	Oct.	171	$203,171	$17	$212,746	$33,635	$18,005	$8,963	$56,398	$126,110	59.3	$86,636	$72,740	$57,639	$42,434	$61,894
	10 mos.	171	1,757,257	355	1,864,782	297,216	165,680	84,591	527,257	1,165,459	62.5	699,323	574,581	395,835	309,604	440,120
Alton	Oct.	956	1,118,651	172,864	1,501,723	284,893	185,165	46,098	511,939	1,084,365	72.2	417,358	332,239	150,531	147,274	179,704
	10 mos.	956	9,939,994	1,698,342	13,373,030	2,310,549	2,074,423	479,367	5,058,667	10,503,415	78.5	2,869,615	2,018,147	261,301	—637,957	549,147
Atchison, Topeka & Santa Fe System	Oct.	13,227	12,746,017	1,280,074	15,271,319	2,394,414	3,310,782	403,350	5,038,761	11,569,299	75.8	3,702,020	2,394,378	2,460,907	2,341,269	3,403,814
	10 mos.	13,231	103,762,045	13,065,391	12,751,331	20,381,226	29,556,745	4,190,006	44,742,877	103,149,743	80.9	24,363,588	12,950,020	13,350,565	12,393,721	22,762,873
Atlanta & West Point	Oct.	93	109,534	23,795	161,078	16,002	39,004	8,615	60,714	135,283	84.0	25,795	12,710	—1,465	12,469	7,475
	10 mos.	93	1,017,433	228,882	1,473,152	183,712	303,423	82,254	596,629	1,265,725	85.9	207,427	131,463	—15,995	—49,011	75,089
Western of Alabama	Oct.	133	107,429	24,658	150,292	13,439	40,296	7,355	54,621	125,295	83.4	24,997	7,741	7,534	16,378	15,400
	10 mos.	133	907,805	232,044	1,294,680	188,718	326,339	70,590	515,026	1,185,412	91.6	109,268	14,001	26,010	—67,194	151,570
Atlanta, Birmingham & Coast	Oct.	639	267,393	9,676	308,399	49,600	50,875	23,603	105,754	254,450	82.5	53,949	22,713	10,220	—4,980	19,646
	10 mos.	639	2,341,873	170,786	2,819,749	435,345	501,004	222,596	1,056,767	2,459,480	87.2	360,269	203,854	60,680	—77,154	172,057
Atlantic Coast Line	Oct.	5,105	2,604,832	379,386	3,428,983	382,577	761,043	130,405	1,327,373	2,749,172	80.2	679,811	404,811	392,817	340,705	566,012
	10 mos.	5,129	25,724,240	5,751,692	35,734,879	3,899,903	6,933,260	1,273,916	14,011,579	27,765,767	77.7	7,969,112	4,169,112	3,403,228	1,972,191	5,167,421
Charleston & Western Carolina	Oct.	342	186,654	1,127	194,525	26,407	29,527	7,192	63,301	131,534	67.6	62,991	44,491	44,452	37,700	50,667
	10 mos.	342	1,783,323	12,903	1,845,407	259,075	284,206	65,724	598,042	1,258,190	68.2	587,217	392,217	369,230	271,949	431,823
Baltimore & Ohio	Oct.	6,486	14,002,082	961,038	15,893,214	1,866,508	2,919,868	403,825	5,093,270	10,984,892	69.1	4,908,322	4,032,747	3,456,674	3,076,577	4,065,591
	10 mos.	6,486	121,766,799	9,299,116	139,190,756	12,979,907	31,331,939	3,904,512	46,950,667	101,989,835	73.3	37,200,921	28,801,782	24,603,252	20,329,660	30,752,066
Staten Island Rapid Transit	Oct.	23	55,542	72,760	136,350	15,650	21,244	1,687	87,237	138,076	101.3	—1,726	—23,526	—38,282	—38,734	—30,864
	10 mos.	23	477,891	779,811	1,338,351	137,024	211,215	18,369	849,616	1,339,686	100.1	—1,335	—213,485	—360,566	—429,704	—286,409
Bangor & Aroostook	Oct.	603	514,027	14,689	542,953	68,562	82,128	5,310	125,585	305,530	56.3	237,423	175,259	175,316	161,088	197,543
	10 mos.	603	4,478,539	181,625	4,855,049	917,708	860,106	53,485	1,275,336	3,344,543	68.9	1,510,506	1,018,629	1,019,276	1,345,678	1,241,892
Bessemer & Lake Erie	Oct.	225	2,025,750	773	2,041,873	110,260	289,878	12,375	254,664	703,316	34.4	1,338,557	1,054,757	1,111,745	403,069	1,185,788
	10 mos.	225	12,968,512	30,075	13,132,319	1,176,343	2,768,389	117,517	1,963,089	6,395,018	48.7	6,737,301	5,443,218	5,840,392	2,569,001	6,432,727
Boston & Maine	Oct.	1,988	3,130,910	598,773	4,305,968	519,100	660,313	65,458	1,569,881	3,002,019	69.7	1,303,949	1,012,623	818,942	672,362	953,699
	10 mos.	1,993	27,194,202	5,766,525	38,079,009	6,047,594	6,205,609	665,346	15,421,379	30,214,170	79.4	7,864,839	5,079,702	3,176,675	4,995,338	4,540,451
Brooklyn Eastern District Terminal	Oct.	12.41	127,809	.....	130,416	10,129	11,007	489	36,031	64,566	49.5	65,850	54,838	54,838	42,738	.....
	10 mos.	12.41	1,077,029	.....	1,100,557	66,914	101,206	4,986	304,077	540,746	49.1	559,806	472,832	473,799	341,835	.....
Burlington, Rock Island	Oct.	255	92,335	16,877	115,351	20,583	13,973	4,495	47,207	94,663	82.1	20,688	15,088	—231	9,872	1,723
	10 mos.	255	589,451	64,688	706,687	176,577	123,323	40,258	381,769	795,902	112.6	—89,215	—159,866	—252,621	—277,371	—231,877
Cambria & Indiana	Oct.	37	128,864	.....	129,043	6,694	38,746	416	13,459	65,066	50.42	63,977	16,208	85,641	41,571	100,959
	10 mos.	37	1,046,392	.....	1,048,037	84,429	548,905	3,824	125,201	820,416	78.28	227,621	—36,204	655,398	695,599	812,029
Canadian Pacific Lines in Maine	Oct.	233	119,489	11,347	143,440	41,940	28,614	9,260	54,460	141,435	98.6	2,005	—6,737	—20,145	—33,593	—18,035
	10 mos.	233	1,501,355	149,373	1,777,706	400,041	392,323	96,245	706,328	1,669,237	93.9	108,469	18,254	—169,492	—183,747	—148,768
Canadian Pacific Lines in Vermont	Oct.	85	74,581	9,691	95,537	16,804	20,531	4,117	55,654	102,682	107.4	—7,145	—6,815	—26,341	—54,086	—26,341
	10 mos.	85	644,921	88,366	847,957	195,533	251,152	42,856	565,656	1,111,813	131.1	—263,856	—327,557	—513,757	—433,885	—513,757
Central of Georgia	Oct.	1,926	1,230,759	114,332	1,500,313	163,350	285,196	56,110	544,121	1,130,123	75.3	370,190	264,127	245,803	262,483	310,544
	10 mos.	1,926	10,507,146	1,169,331	13,092,108	1,624,682	2,757,303	529,399	5,245,546	10,975,472	83.8	2,116,636	1,120,778	897,383	823,187	1,539,429
Central of New Jersey	Oct.	681	2,334,521	363,247	2,884,717	215,455	516,351	45,405	1,088,850	1,982,791	68.7	901,926	381,086	264,049	121,891	389,920
	10 mos.	681	20,598,651	3,898,767	26,165,403	2,034,084	4,939,691	483,580	10,949,742	19,564,990	74.8	6,600,413	2,625,718	1,279,811	2,170,695	2,550,326
Central Vermont	Oct.	455	441,667	28,423	516,021	67,189	128,926	13,785	243,113	477,436	92.5	38,585	15,261	—41,887	32,423	—16,335
	10 mos.	454	4,080,233	331,706	4,819,960	894,782	1,018,847	145,098	2,381,127	4,670,740	96.9	149,220	—48,143	—274,870	301,208	—8,435
Chesapeake & Ohio	Oct.	3,106	12,921,076	327,059	13,742,824	1,059,279	2,000,889	193,374	2,673,270	6,260,575	45.6	7,482,249	6,294,434	6,323,889	4,945,916	7,044,081
	10 mos.	3,106	105,002,727	2,832,960	111,807,908	10,329,244	19,440,623	1,913,740	23,752,701	58,648,456	52.5	53,159,452	42,264,807	42,542,921	31,980,282	49,580,626
Chicago & Eastern Illinois	Oct.	931	1,202,582	111,901	1,497,961	141,387	236,642	58,465	508,852	1,006,108	67.2	491,853	411,853	267,547	173,324	315,928
	10 mos.	931	10,319,382	1,111,946	12,974,733	1,502,277	2,229,505	556,349	4,864,679	9,778,399	75.4	3,196,334	2,436,334	1,009,390	351,217	1,500,342
Chicago & Illinois Midland	Oct.	131	406,442	1,346	416,225	25,744	49,191	16,750	84,193	193,488	46.5	222,737	182,056	175,690	75,055	189,299
	10 mos.	131	2,928,513	12,826	3,020,752	268,741	524,949	167,888	738,667	1,872,652	62.0	1,148,100	937,011	941,014	710,105	1,077,193
Chicago & North Western	Oct.	8,355	7,341,900	850,229	9,140,102	1,258,556	1,537,692	164,030	3,150,824	6,458,926	70.7	2,681,176	2,163,966	1,885,325	1,059,226	2,293,575
	10 mos.	8,355	59,884,747	8,903,994	76,708,272	13,386,184	16,974,710	1,734,378	29,590,107	65,081,169	84.8	11,627,103	5,546,910	3,293,475	2,191,547	7,405,319
Chicago, Burlington & Quincy	Oct.	8,976	8,091,890	694,561	9,834,129	1,133,688	1,320,419	214,182	3,135,622	6,142,690	62.5	3,691,439	2,772,668	2,332,464	2,115,455	2,717,097
	10 mos.	9,009	65,508,989	6,758,265	80,483,511	11,166,849	13,801,014	2,309,083	28,416,703	59,228,076	73.6	21,255,435	14,337,665	10,284,814	5,982,422	14,108,026
Chicago Great Western	Oct.	1,512	1,720,280	49,001	1,903,799	249,913	246,806	54,522	626,445	1,226,085	64.4	677,714	590,685	355,254	252,214	398,975
	10 mos.	1,512	13,824,614	471,914	15,328,839	2,231,212	2,064,972	535,693	5,663,884	11,014,520	71.9	4,314,319	3,540,857	1,576,138	574,040	1,996,594
Chicago, Indianapolis & Louisville	Oct.	572	792,180	49,089	941,819	86,232	217,722	28,346	344,806	714,522	75.9	227,297	176,810	79,785	65,062	116,862
	10 mos.	572	7,055,626	494,702	8,474,705	806,463	2,019,025	283,233	3,291,615	6,750,372	79.7	1,724,333	1,311,362	293,152	—14,429	698,380

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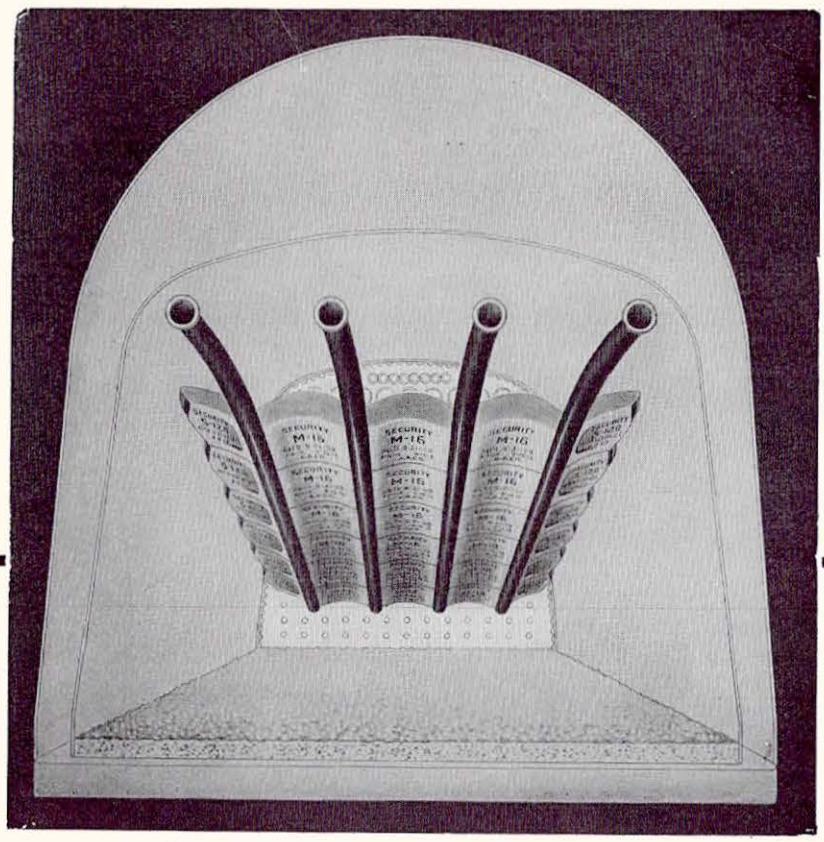
ONLY A CORRECT ARCH CAN GIVE FULL ECONOMY

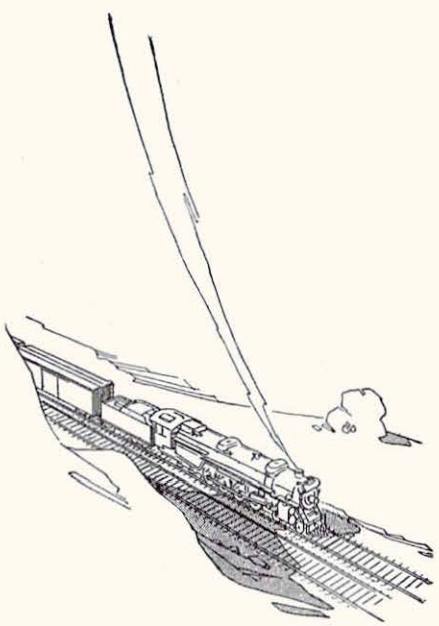


An important phase of the American Arch Company leadership is the determination to leave no stone unturned to supply the railroads with the most effective locomotive Brick Arches.

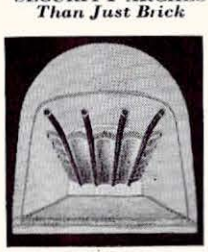
While Security Arch Brick is highly standardized for economy and ease of handling, each class of locomotive calls for its individual design of brick arch.

For new locomotives the brick arch is designed to suit. Where power has been modernized, be sure that it too gets the advantage of a Security Brick Arch designed to suit its needs.

Our engineers will gladly cooperate with you.



There's More to
SECURITY ARCHES
Than Just Brick



HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1936	1935	Before depr. & ret.
Chicago, Milw., St. Paul & Pacific	Oct.	11,126	$8,811,390	$692,783	$10,458,585	$1,664,311	$1,641,774	$213,717	$3,553,148	$7,394,905	70.7	$3,063,680	$2,385,680	$1,849,172	$1,634,230	$2,293,420
	10 mos.	11,127	75,971,396	6,194,727	90,440,357	16,251,123	16,270,321	2,128,893	33,602,572	71,553,094	79.1	18,887,263	12,051,263	6,803,182	2,376,175	11,271,862
Chicago, Rock Island & Pacific	Oct.	7,531	5,332,591	597,490	6,585,722	1,142,040	1,276,236	206,618	2,543,434	5,475,684	83.1	1,110,038	674,616	411,772	526,467	760,128
	10 mos.	7,570	49,309,408	5,745,786	61,087,273	8,774,142	14,245,948	1,999,131	25,403,081	54,218,139	88.8	6,869,134	2,278,223	—639,349	—751,142	2,922,326
Chicago, Rock Island & Gulf	Oct.	626	267,729	32,153	387,820	46,580	46,083	17,251	120,348	254,585	65.6	133,235	110,049	65,623	30,044	69,497
	10 mos.	626	2,538,747	282,010	3,603,465	546,257	362,537	162,462	1,268,672	2,599,240	72.1	1,004,225	781,133	253,218	31,808	293,300
Chicago, St. Paul, Minneap. & Omaha	Oct.	1,648	1,444,470	144,395	1,705,975	217,000	263,004	36,335	731,679	1,328,702	77.9	377,273	272,440	143,663	206,301	192,854
	10 mos.	1,648	12,897,447	1,366,733	15,336,778	1,842,168	2,608,815	352,685	7,069,512	12,654,308	82.5	2,682,470	1,661,596	481,467	34,896	977,600
Clinchfield Railroad	Oct.	309	559,286	4,183	569,626	39,600	135,177	18,258	107,027	316,404	55.5	253,222	186,630	234,352	219,179	276,182
	10 mos.	309	4,966,873	44,839	5,066,571	384,897	1,193,700	175,549	988,447	2,887,888	57.0	2,178,683	1,690,622	2,087,841	1,547,272	2,519,689
Colorado & Southern	Oct.	956	651,376	37,254	752,733	78,335	128,385	13,721	281,817	537,104	71.4	215,629	149,587	113,245	129,659	144,603
	10 mos.	995	5,121,007	350,178	6,013,160	745,843	1,125,438	139,781	2,390,421	4,749,921	79.0	1,263,239	623,753	374,542	12,963	690,072
Fort Worth & Denver City	Oct.	902	502,761	62,010	570,212	38,165	76,777	18,287	179,217	347,948	61.0	222,264	185,841	148,585	183,974	165,739
	10 mos.	902	4,362,155	483,111	4,856,752	440,668	825,387	187,744	1,552,315	3,361,883	69.2	1,494,869	1,149,079	827,083	496,496	1,002,407
Columbus & Greenville	Oct.	167	122,539	9,909	141,165	27,789	17,613	4,400	46,056	105,563	74.8	35,602	28,895	24,094	31,606	26,877
	10 mos.	167	853,821	68,602	981,062	180,759	154,244	39,154	366,440	840,596	85.7	140,466	101,447	80,421	23,360	108,321
Delaware & Hudson	Oct.	831	2,158,506	95,740	2,337,885	303,524	498,050	45,332	781,018	1,761,440	75.3	576,445	431,459	436,247	73,882	526,151
	10 mos.	831	18,878,441	1,001,715	20,753,946	2,796,944	4,983,487	456,026	7,617,467	17,182,278	82.8	3,571,668	2,206,097	2,267,451	1,241,842	3,182,003
Delaware, Lackawanna & Western	Oct.	984	3,389,323	560,377	4,480,680	341,551	781,466	115,884	1,859,586	3,270,243	73.0	1,210,437	875,437	872,546	563,753	1,093,657
	10 mos.	987	30,513,205	5,777,601	41,007,917	3,822,218	7,729,395	1,149,198	18,305,766	32,782,469	79.9	8,225,448	4,877,448	4,726,302	2,564,589	6,948,921
Denver & Rio Grande Western	Oct.	2,576	2,760,032	150,288	3,021,489	367,774	458,702	52,329	987,126	1,920,111	63.6	1,101,378	915,594	792,685	743,331	888,637
	10 mos.	2,583	18,672,453	1,310,689	20,984,478	3,505,485	5,450,320	527,697	7,165,112	17,318,028	82.5	3,666,450	1,794,378	1,068,653	1,459,921	2,029,835
Denver & Salt Lake	Oct.	232	367,999	5,652	385,113	54,083	55,455	2,235	81,180	194,855	50.6	190,258	163,255	178,431	179,165	202,442
	10 mos.	232	2,098,303	75,271	2,265,971	393,063	618,618	23,077	584,449	1,645,428	72.6	620,543	410,775	783,037	991,486	862,391
Detroit & Mackinac	Oct.	242	86,243	3,359	96,716	14,870	17,451	865	27,030	64,093	66.3	32,623	29,954	24,606	28,077	27,471
	10 mos.	242	547,539	30,875	641,627	109,590	120,168	9,240	234,232	507,712	79.1	133,915	117,852	82,541	50,837	111,688
Detroit & Toledo Shore Lines	Oct.	50	332,601	.....	334,720	22,833	25,106	7,975	73,004	136,715	40.8	198,005	164,703	106,304	93,460	111,863
	10 mos.	50	3,131,245	.....	3,146,730	274,736	255,724	78,141	753,896	1,437,097	45.7	1,709,633	1,404,253	858,779	793,298	914,371
Detroit, Toledo & Ironton	Oct.	472	540,056	197	566,639	68,674	85,801	11,414	124,613	315,990	55.8	250,649	207,034	172,082	197,879	193,255
	10 mos.	472	6,175,144	2,444	6,354,934	637,270	834,162	106,659	1,357,127	3,186,048	50.1	3,168,886	2,561,289	2,197,009	2,639,528	2,413,160
Duluth, Missabe & Northern	Oct.	556	2,648,306	1,677	3,078,327	180,912	219,397	3,640	465,254	911,838	29.6	2,166,489	1,890,582	1,886,862	868,383	1,961,523
	10 mos.	558	15,228,112	25,404	17,512,218	1,516,997	2,127,477	38,135	2,779,573	6,908,145	39.4	10,604,073	9,006,445	8,993,555	4,790,844	9,742,039
Duluth, Winnipeg & Pacific	Oct.	178	110,465	1,627	116,069	16,444	16,415	1,779	45,781	85,677	73.8	30,392	22,135	14,175	—4,319	17,153
	10 mos.	178	1,075,572	20,488	1,127,816	236,599	176,356	17,933	449,735	925,658	82.1	202,158	124,778	—23,939	—143,309	7,303
Elgin, Joliet & Eastern	Oct.	434	1,413,778	152	1,707,794	148,175	353,636	15,069	604,572	1,167,952	68.4	539,842	437,905	361,997	308,214	436,151
	10 mos.	434	13,045,696	198	15,286,578	1,413,996	3,269,708	139,759	5,435,141	10,714,439	70.1	4,572,139	3,451,185	3,082,171	2,225,745	3,829,889
Erie	Oct.	2,297	7,053,328	423,428	8,088,017	601,504	1,396,753	172,461	2,725,617	5,199,614	64.3	2,888,403	2,354,401	1,985,583	2,039,217	2,310,797
	10 mos.	2,297	60,113,446	4,437,166	69,852,524	5,951,575	12,968,756	1,698,754	25,124,374	48,767,839	69.8	21,084,685	16,368,732	13,513,134	10,632,445	16,752,697
New Jersey & New York	Oct.	45	19,658	46,468	68,385	5,048	13,802	735	47,696	68,970	100.9	—585	—5,863	—19,941	—33,008	—19,930
	10 mos.	45	160,774	472,964	653,751	51,159	151,271	6,298	482,925	709,640	108.5	—55,889	—105,197	—263,682	—354,161	—263,572
New York, Susque. & Western	Oct.	215	229,646	23,481	264,239	24,265	30,702	4,727	115,326	188,635	71.4	75,604	50,573	31,982	14,116	37,469
	10 mos.	215	2,483,469	241,136	2,846,995	258,939	350,691	47,802	1,236,393	2,029,053	71.3	817,942	577,495	302,367	282,535	359,205
Florida East Coast	Oct.	684	373,341	94,785	530,206	86,010	143,424	23,660	182,057	481,803	90.9	48,403	10,567	—14,379	—143,788	25,311
	10 mos.	709	4,304,578	1,920,908	6,988,598	989,972	1,328,602	221,944	2,272,175	5,342,266	76.4	1,646,332	901,383	517,197	—277,157	1,054,432
Fort Smith & Western	Oct.	249	91,292	1,158	95,971	18,474	9,216	6,254	25,339	62,200	64.8	33,771	32,771	22,040	6,218	22,606
	10 mos.	249	612,040	10,268	655,070	158,006	85,934	56,626	208,125	540,189	82.5	114,881	101,100	27,046	—58,408	32,722
Georgia Railroad	Oct.	329	316,117	13,763	360,566	31,523	54,769	18,303	149,151	267,566	74.2	93,000	65,823	74,797	75,205	85,816
	10 mos.	329	2,673,254	143,909	3,059,039	292,369	600,838	175,398	1,293,923	2,499,153	81.7	559,886	475,779	560,068	489,089	673,270
Georgia & Florida	Oct.	408	96,008	3,443	103,681	24,296	18,311	8,177	37,641	94,320	91.1	9,361	2,252	—232	1,305	5,041
	10 mos.	408	922,555	27,091	989,184	236,903	172,725	83,988	361,760	912,402	92.2	76,782	8,854	—9,114	27,223	43,360
Grand Trunk Western	Oct.	1,032	1,775,686	73,553	1,995,542	263,754	364,039	34,845	808,087	1,561,155	78.2	434,387	341,190	113,301	327,428	202,140
	10 mos.	1,032	17,283,269	761,730	19,447,035	2,522,758	3,661,801	352,015	7,660,028	15,054,200	77.4	4,392,835	3,318,449	2,069,817	1,834,308	3,000,883
Canadian Nat'l Lines in New Eng.	Oct.	172	119,230	4,495	131,051	25,275	12,525	2,396	55,160	104,361	79.6	26,690	11,219	—14,700	—53,027	—11,796
	10 mos.	172	978,657	63,954	1,133,922	384,117	193,874	24,292	595,141	1,288,249	113.6	—154,327	—303,356	—568,641	—599,486	—538,940
Great Northern	Oct.	8,155	9,419,129	389,179	10,526,828	760,812	1,094,107	177,985	2,939,969	5,250,213	49.9	5,276,615	4,534,073	4,203,372	5,184,393	4,505,220
	10 mos.	8,207	65,378,377	4,155,937	75,762,661	7,388,380	11,563,405	1,791,413	24,050,473	47,588,498	62.8	28,174,163	21,638,293	20,447,594	20,150,636	23,501,246

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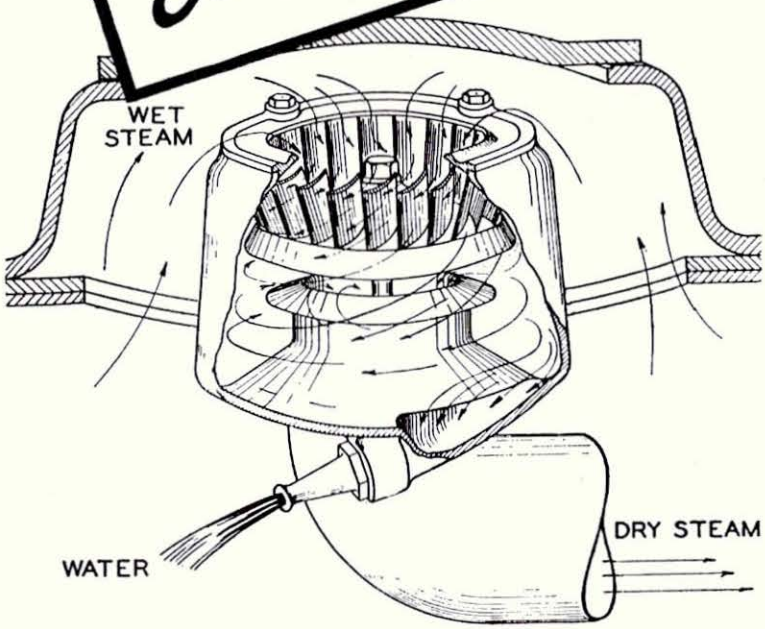
The Elesco Tangential Steam Dryer* Ejects Trapped Water *Economically...*



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Fixed vanes are designed to impart the whirling motion to the steam, with a minimum of friction and maximum kinetic energy of the separated water. This unique and outstanding quality enables the Elesco tangential steam dryer to discharge the separated water back into the boiler against the boiler pressures, thus eliminating the necessity of using trap or other means for discharging the water outside of the boiler, and saving water, fuel and maintenance.

The Elesco tangential steam dryer is low in first cost, and the cost for maintenance is practically nothing—it pays a substantial return on the investment.

THE SUPERHEATER COMPANY

Representative of American Throttle Company, Inc.

60 East 42nd Street, New York
Peoples Gas Building, Chicago

Canada: The Superheater Company, Limited, Montreal

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ELESCO

Tangential Steam Dryers

Superheaters - Superheated Steam Pyrometers - Exhaust Steam Injectors - Feed Water Heaters - American Throttles

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1936	After depr. & retir. 1935	Before depr. & ret.
Green Bay & Western	Oct.	234	$144,489	$636	$150,124	$32,782	$23,569	$6,099	$50,158	$116,148	77.3	$33,976	$23,352	$14,741	$22,463	$18,870
	10 mos.	234	1,270,067	8,067	1,333,312	305,301	163,402	58,885	452,287	1,020,440	76.5	312,872	212,143	138,455	137,063	179,450
Gulf & Ship Island	Oct.	259	101,463	8,815	122,450	22,811	18,934	3,296	58,218	107,997	88.2	14,453	—1,122	—9,820	—9,915	—6,351
	10 mos.	259	1,006,870	90,596	1,222,632	189,104	183,909	33,491	593,457	1,056,997	86.5	165,635	14,191	—84,085	—67,208	—44,486
Gulf, Mobile & Northern	Oct.	936	658,082	31,930	715,211	54,184	82,052	40,569	175,783	383,957	53.68	331,254	263,254	190,915	160,375	209,180
	10 mos.	936	5,545,734	260,704	6,041,734	613,750	864,603	363,340	1,575,193	3,709,621	61.40	2,332,113	1,815,334	1,191,259	886,947	1,387,129
Illinois Central	Oct.	4,972	8,177,574	759,735	9,592,883	876,360	2,100,477	227,491	3,254,781	6,876,006	71.7	2,716,877	2,057,884	1,843,116	1,607,955	2,380,110
	10 mos.	4,974	66,977,125	7,485,231	80,806,264	7,572,594	18,151,440	2,261,154	30,182,001	62,261,502	77.1	18,544,762	12,367,699	10,234,148	8,800,576	15,678,771
Yazoo & Mississippi Valley	Oct.	1,619	1,469,268	101,605	1,665,694	105,858	277,655	32,621	582,953	1,056,218	63.4	609,476	470,068	360,613	310,748	409,195
	10 mos.	1,619	11,111,858	767,627	12,689,704	1,018,519	2,046,240	329,529	4,746,399	8,694,769	68.5	3,994,935	2,656,126	1,728,842	584,118	2,169,936
Illinois Central System	Oct.	6,592	9,646,842	861,340	11,258,577	982,218	2,378,132	260,112	3,837,734	7,932,224	70.5	3,326,353	2,527,513	2,214,029	1,923,703	2,799,605
	10 mos.	6,594	78,088,983	8,252,858	93,495,968	8,591,113	20,197,680	2,590,683	34,928,400	70,956,271	75.9	22,539,697	15,010,205	12,053,787	9,448,769	17,939,504
Illinois Terminal	Oct.	504	434,130	69,459	547,838	62,224	68,056	16,172	164,561	329,118	60.08	218,720	175,784	151,474	132,667	170,484
	10 mos.	511	3,851,603	682,276	4,934,774	528,379	673,825	159,474	1,591,188	3,131,513	63.46	1,803,261	1,425,674	1,235,677	950,006	1,425,952
Kansas City Southern	Oct.	878	1,169,152	24,735	1,310,159	112,214	229,453	50,464	353,969	815,865	62.3	494,294	373,794	294,849	188,162	324,133
	10 mos.	878	10,113,871	188,956	11,359,312	989,436	1,806,505	481,751	3,148,444	7,111,058	62.6	4,248,254	3,314,254	2,632,749	1,101,829	2,922,361
Kansas Oklahoma & Gulf	Oct.	326	210,248	629	213,711	29,964	23,622	8,304	42,023	106,681	49.9	107,030	81,570	64,235	61,949	66,328
	10 mos.	326	2,021,093	5,436	2,053,081	265,289	222,959	78,921	440,956	984,547	48.0	1,068,534	851,792	654,356	405,720	675,240
Lake Superior & Ishpeming	Oct.	160	360,010	78	417,775	33,075	22,303	891	60,637	123,056	29.5	294,719	234,083	232,853	250,404	246,087
	10 mos.	160	2,329,481	956	2,676,565	292,479	249,384	6,644	418,340	1,027,364	38.4	1,649,201	1,229,430	1,216,043	836,730	1,348,898
Lehigh & Hudson River	Oct.	96	146,804	106	147,606	10,567	16,146	3,956	46,671	84,660	57.4	62,946	46,289	34,240	25,575	37,924
	10 mos.	96	1,289,203	1,127	1,297,977	139,809	181,099	36,657	470,846	900,271	69.4	397,706	267,414	146,057	173,098	183,613
Lehigh & New England	Oct.	218	363,465	227	366,387	37,858	76,332	6,204	123,157	258,515	70.6	107,872	80,146	78,365	71,170	96,541
	10 mos.	219	3,263,798	2,699	3,293,032	349,040	710,740	61,577	1,158,025	2,431,640	73.8	861,392	657,149	650,776	738,891	832,158
Lehigh Valley	Oct.	1,331	4,120,984	211,210	4,622,673	442,242	741,203	114,452	1,699,802	3,168,873	68.6	1,453,800	1,263,519	1,095,165	719,271	1,285,354
	10 mos.	1,333	35,322,302	2,187,332	40,153,496	2,646,626	6,927,064	1,127,966	16,826,233	29,178,748	72.7	10,974,748	8,919,420	7,179,007	3,882,733	9,090,198
Louisiana & Arkansas	Oct.	606	411,874	4,221	434,976	51,416	75,491	31,149	230,502	410,889	94.5	24,087	14,403	—11,416	116,752	2,624
	10 mos.	606	4,375,170	93,337	4,643,032	617,197	657,233	284,673	1,289,032	3,033,494	65.3	1,609,538	1,226,619	1,005,394	922,034	1,148,333
Louisiana, Arkansas & Texas	Oct.	255	94,108	248	99,780	28,438	8,520	4,726	83,657	131,260	131.5	—31,480	—36,660	—52,248	17,326	—51,519
	10 mos.	255	1,003,667	2,665	1,057,161	276,227	98,619	46,746	398,074	866,934	82.0	190,227	144,261	—18,832	38,887	—11,360
Louisville & Nashville	Oct.	4,970	7,653,259	553,786	8,773,696	829,404	1,950,959	179,281	2,635,732	5,920,114	67.5	2,853,582	2,028,358	2,150,463	1,468,684	2,498,615
	10 mos.	4,994	63,337,547	5,399,289	73,820,060	7,431,517	16,854,420	1,805,105	24,372,356	53,627,347	72.6	20,192,713	15,178,099	15,592,920	11,033,740	19,076,288
Maine Central	Oct.	1,046	937,043	77,005	1,112,395	161,755	188,585	12,252	386,827	791,296	71.1	321,099	253,249	205,089	218,695	248,934
	10 mos.	1,046	8,266,575	832,621	10,041,523	1,818,805	1,714,451	115,305	3,776,024	7,824,147	77.9	2,217,376	1,561,326	1,004,012	1,426,040	1,447,884
Midland Valley	Oct.	351	157,595	2	159,861	15,275	11,155	2,424	33,708	66,458	41.6	93,403	83,757	72,161	57,598	74,293
	10 mos.	354	1,247,036	117	1,266,523	165,503	127,686	23,164	304,936	672,739	53.1	593,784	506,232	421,871	329,288	443,153
Minneapolis & St. Louis	Oct.	1,530	808,189	13,383	863,594	133,740	129,354	41,350	315,226	658,406	76.2	205,188	158,058	107,713	137,697	135,104
	10 mos.	1,578	7,056,834	125,037	7,546,719	995,198	1,215,196	367,727	3,015,129	5,963,689	79.0	1,583,030	1,150,555	657,879	20,882	941,596
Minneap., St. Paul & S. S. Marie	Oct.	4,296	2,410,383	81,242	2,700,819	316,321	373,949	57,333	977,931	1,834,672	67.9	866,147	682,947	517,672	707,415	618,641
	10 mos.	4,296	19,582,587	1,073,197	22,452,267	3,070,247	3,706,914	595,116	8,906,004	17,406,717	77.5	5,045,550	3,379,557	1,946,198	1,344,716	2,963,723
Duluth, South Shore & Atlantic	Oct.	550	248,536	12,507	287,200	34,945	42,031	4,121	93,976	179,171	62.4	108,029	94,766	84,173	35,627	91,735
	10 mos.	550	2,142,130	125,563	2,488,830	341,440	391,723	43,105	864,333	1,689,147	67.9	799,683	681,919	587,837	377,293	664,919
Spokane International	Oct.	163	67,224	1,368	74,765	17,169	8,088	1,897	22,759	54,244	72.6	20,521	25,837	19,998	—3,618	21,602
	10 mos.	163	581,949	14,218	653,472	146,997	68,402	18,703	213,334	489,735	74.9	163,737	126,813	85,636	—12,475	100,748
Mississippi Central	Oct.	150	72,618	2,376	77,469	17,061	10,067	7,112	20,220	59,978	77.4	17,491	13,554	10,617	6,542	12,854
	10 mos.	150	723,702	14,669	761,241	129,137	111,801	68,577	201,199	563,141	74.0	198,100	161,236	125,778	38,040	147,225
Missouri-Arkansas	Oct.	364	85,358	1,569	92,089	25,538	11,027	5,451	30,093	77,610	84.3	14,479	7,938	—1,119	1,596	—267
	10 mos.	364	778,717	13,338	849,349	207,691	102,278	47,744	285,263	691,909	72.9	157,440	125,087	40,080	68,695	48,435
Missouri-Illinois	Oct.	205	125,789	1,114	128,796	23,887	15,806	2,609	39,021	87,099	67.6	41,697	36,618	22,479	9,522	25,616
	10 mos.	205	904,702	7,066	929,668	203,633	124,662	24,827	308,921	712,812	76.7	216,856	160,692	52,306	37,334	86,097
Missouri-Kansas-Texas Line	Oct.	3,293	2,446,287	244,075	2,969,379	298,962	384,479	112,442	950,546	1,890,088	63.7	1,079,291	988,420	765,913	752,348	838,775
	10 mos.	3,293	21,572,093	1,981,105	25,885,616	3,233,354	4,560,668	1,168,326	8,866,076	19,249,548	74.4	6,636,068	5,033,854	2,945,745	840,808	3,982,282
Missouri Pacific	Oct.	7,216	7,481,223	487,974	8,631,801	1,251,110	1,559,089	243,256	2,842,405	6,195,978	71.8	2,435,823	2,022,268	1,520,025	976,270	1,880,695
	10 mos.	7,224	64,037,331	4,235,612	74,308,021	10,168,867	14,440,522	2,406,521	26,212,626	56,251,998	75.7	18,056,023	13,754,514	8,738,158	4,076,923	12,250,548
Gulf Coast Lines	Oct.	1,763	941,597	48,537	1,039,020	164,144	201,486	44,642	346,358	807,359	77.70	231,661	164,239	80,633	—21,061	114,098
	10 mos.	1,763	9,067,959	372,320	9,984,969	1,604,390	1,873,264	447,241	3,198,038	7,603,801	76.15	2,381,168	1,736,631	726,628	180,669	1,066,197

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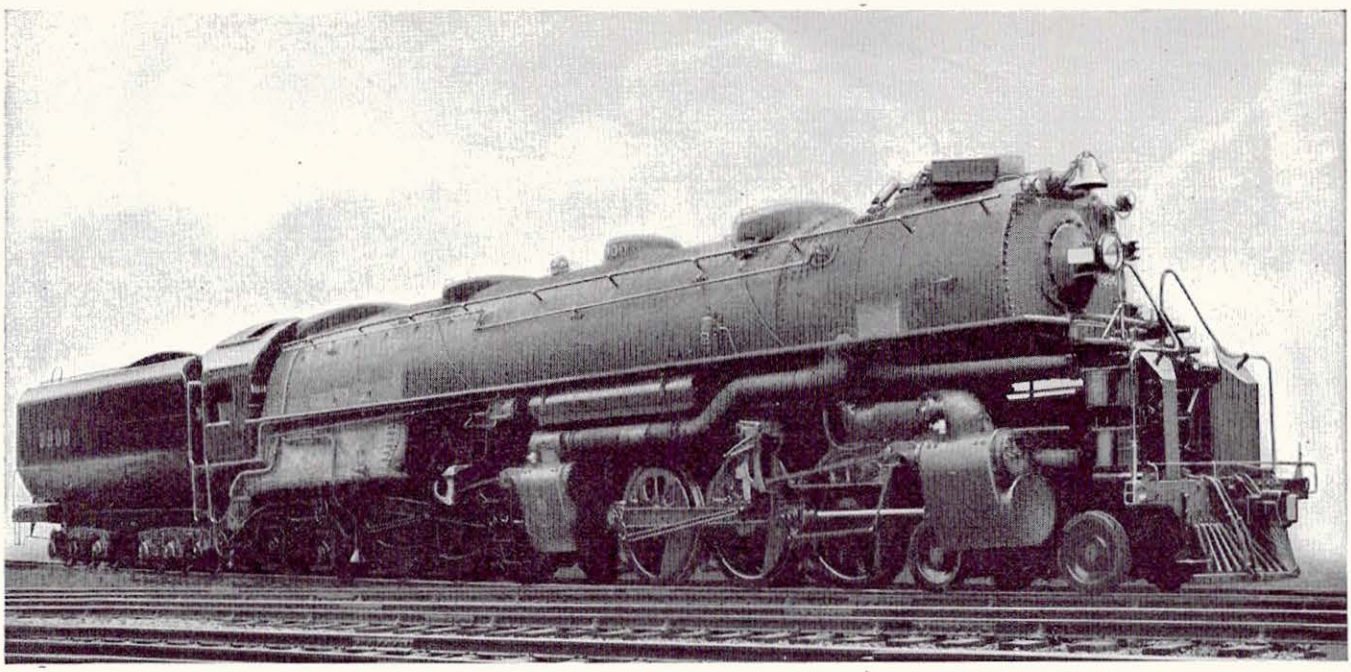
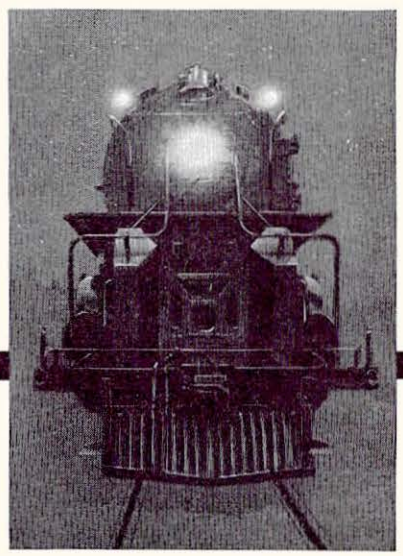


The "CHALLENGER" Type

A Motive Power Unit
approaching
100,000 lb. Tractive Power
for
High-Speed Through Freight Service
with
Lowest Possible Maintenance
both for
Locomotive and Right-of-way.

Weight on Drivers,	386,000 pounds
Weight of Engine,	566,000 pounds
Cylinders,	22 x 32 inches
Diameter of Drivers,	69 inches
Boiler Pressure,	255 pounds
Maximum Tractive Power,	97,400 pounds

NEW POWER — NEW PROFITS



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AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET, NEW YORK CITY

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1936	After depr. & retir. 1935	Before depr. & ret.
International-Great Northern	Oct.	1,154	$976,549	$87,494	$1,182,385	$166,222	$217,957	$32,553	$444,113	$915,582	77.44	$266,803	$211,159	$110,557	$174,197	$142,696
	10 mos.	1,154	8,271,725	750,300	10,037,366	1,457,574	2,004,617	307,689	4,115,169	8,433,150	84.02	1,604,216	1,086,684	126,861	536,358	437,532
Mobile & Ohio	Oct.	1,201	1,008,862	35,279	1,098,033	121,085	191,962	43,863	371,299	771,567	70.3	326,466	275,544	220,109	73,036	271,058
	10 mos.	1,201	8,031,331	304,167	8,797,323	1,076,532	1,851,628	415,095	3,144,290	6,895,103	78.4	1,902,220	1,415,887	901,376	82,547	1,414,118
Monongahela	Oct.	171	451,805	834	454,961	42,616	26,844	498	90,295	163,073	35.8	291,888	258,511	172,343	80,684	177,845
	10 mos.	172	3,809,103	8,919	3,839,435	381,343	286,642	4,345	791,760	1,495,835	39.0	2,343,600	2,022,075	1,211,339	926,981	1,268,027
Montour	Oct.	57	244,139	.....	246,074	17,898	45,893	1,039	53,899	126,777	51.5	119,297	90,841	104,291	92,893	115,351
	10 mos	57	1,933,754	.....	1,946,300	143,820	417,953	9,463	446,438	1,090,405	56.0	855,895	648,747	816,293	748,538	926,245
Nashville, Chattanooga & St. Louis	Oct.	1,154	1,124,528	90,799	1,349,525	172,148	306,685	61,104	464,996	1,068,192	79.2	281,333	235,801	217,788	113,016	260,266
	10 mos.	1,154	9,496,818	909,653	11,608,678	1,505,118	2,770,479	604,782	4,476,907	9,999,437	86.1	1,609,241	1,155,246	1,056,572	375,844	1,494,874
Nevada Northern	Oct.	165	42,707	984	48,738	10,942	3,459	968	9,467	28,991	59.5	19,747	11,440	14,158	14,283	20,108
	10 mos.	165	393,239	11,743	452,513	86,444	36,049	8,765	91,792	262,801	58.1	189,712	109,413	137,549	56,509	197,047
New York Central	Oct.	11,218	24,138,782	4,949,048	33,034,358	3,418,055	6,980,914	577,571	11,255,098	23,715,947	71.8	9,318,411	7,065,695	5,791,607	4,741,992	7,147,739
	10 mos.	11,215	209,907,188	51,355,240	294,573,431	30,550,164	62,865,752	5,460,967	107,337,567	220,832,958	75.0	73,740,473	52,081,216	38,471,583	28,106,896	51,974,843
Pittsburgh & Lake Erie	Oct.	233	2,127,518	61,764	2,239,291	234,142	795,745	26,139	617,592	1,758,477	78.5	480,814	325,232	476,861	316,845	623,252
	10 mos.	233	16,951,565	596,774	18,000,649	1,691,174	5,548,985	262,942	5,479,393	13,811,402	76.7	4,189,247	2,706,550	4,394,859	3,202,241	5,894,475
New York, Chicago & St. Louis	Oct.	1,704	3,688,148	71,677	3,887,586	434,397	535,995	115,665	1,186,746	2,416,037	62.1	1,471,549	1,212,669	918,413	991,616	1,047,371
	10 mos.	1,704	32,256,744	824,405	34,248,423	3,429,207	4,864,478	1,154,169	11,145,674	21,924,600	64.0	12,323,823	10,209,092	7,412,233	5,461,791	8,699,195
New York, New Haven & Hartford	Oct.	2,038	4,239,071	2,108,499	7,177,583	721,330	1,142,390	95,227	2,514,708	4,875,688	67.9	2,301,895	1,836,895	1,271,689	830,590	1,554,852
	10 mos.	2,047	36,740,786	20,375,607	64,418,109	8,235,769	11,075,463	985,087	24,298,869	48,560,280	75.4	15,857,829	11,202,829	5,566,803	6,973,763	8,429,903
New York Connecting	Oct.	20	197,625	.....	214,958	17,095	7,889	.....	31,143	57,194	26.6	157,764	122,614	91,805	101,183	91,805
	10 mos.	20	2,201,357	.....	2,321,873	119,249	77,313	.....	319,551	528,360	22.8	1,793,513	1,444,693	1,146,897	1,036,227	1,146,897
New York, Ontario & Western	Oct.	566	618,416	4,722	668,626	90,548	132,719	11,849	284,947	544,342	81.4	124,284	88,222	44,446	73,599	68,993
	10 mos.	566	6,446,711	455,112	7,421,317	809,236	1,378,906	117,832	3,060,170	5,619,455	75.7	1,801,862	1,347,607	962,406	956,407	1,209,622
Norfolk & Western	Oct.	2,181	9,002,133	179,990	9,429,727	1,124,790	1,571,204	122,514	1,804,925	4,803,206	50.9	4,626,521	3,487,375	3,851,081	3,508,318	4,235,138
	10 mos.	2,169	72,697,352	1,816,173	76,733,199	6,384,654	12,181,097	1,242,581	16,479,193	41,196,175	53.7	35,537,024	24,591,697	27,343,917	21,363,286	31,110,147
Norfolk Southern	Oct.	834	363,539	7,490	387,772	75,182	51,151	23,558	144,017	317,384	81.8	70,388	38,827	21,324	53,746	32,434
	10 mos.	834	3,457,075	80,186	3,697,579	694,394	501,442	224,188	1,390,762	3,014,172	81.5	683,407	385,225	218,684	311,017	329,282
Northern Pacific	Oct.	6,727	5,823,259	361,313	6,719,439	597,284	1,065,413	151,556	2,177,998	4,351,983	64.8	2,367,456	1,792,912	2,086,728	1,951,367	2,344,224
	10 mos.	6,727	42,778,145	3,511,910	51,051,327	6,015,589	10,735,972	1,599,956	18,883,246	40,743,454	79.8	10,307,873	4,824,551	7,789,454	5,136,569	10,408,902
Northwestern Pacific	Oct.	351	266,154	70,218	369,551	50,152	56,881	4,549	176,676	300,695	81.4	68,856	60,028	48,279	45,271	62,359
	10 mos.	351	2,101,969	754,069	3,152,645	434,919	545,271	41,722	1,555,114	2,712,417	86.0	440,228	339,187	265,534	2,832	405,007
Oklahoma City-Ada-Atoka	Oct.	132	42,843	439	45,678	13,712	2,471	780	12,773	31,657	69.3	14,021	8,817	968	—1,138	976
	10 mos.	132	425,712	4,039	452,540	86,369	24,660	7,471	111,715	248,437	54.9	204,103	170,808	111,479	37,933	111,552
Pennsylvania	Oct.	10,371	32,690,051	5,748,602	42,559,658	3,728,400	9,174,564	660,433	13,484,018	28,988,939	68.1	13,570,719	9,765,718	9,276,073	7,790,625	11,275,268
	10 mos.	10,406	273,659,757	55,756,258	362,579,512	32,696,645	74,729,190	6,360,315	124,571,433	257,331,040	71.0	105,248,472	76,022,498	68,374,669	57,644,031	86,835,514
Long Island	Oct.	396	624,359	1,402,780	2,132,071	255,760	446,749	33,300	975,844	1,771,398	83.1	360,673	69,105	—110,208	—92,171	—12,663
	10 mos.	396	5,460,550	14,970,117	21,404,998	1,753,940	3,818,934	208,456	9,680,016	16,127,053	75.3	5,277,945	2,511,606	868,563	524,484	1,840,493
Pennsylvania-Reading Seashore Lines	Oct.	412	324,129	192,099	541,290	56,477	66,354	10,349	276,506	438,423	81.0	102,867	19,102	—79,664	—106,917	—72,388
	10 mos.	412	2,681,525	2,749,099	5,670,058	589,135	752,294	118,168	2,956,808	4,698,748	82.9	971,310	26,594	—988,072	—1,403,547	—915,252
Pere Marquette	Oct.	2,115	2,925,664	64,786	3,154,233	307,720	560,038	64,259	989,489	2,014,320	63.9	1,139,913	871,978	738,479	802,625	949,631
	10 mos.	2,115	24,130,663	794,205	26,374,598	2,950,906	5,442,776	646,576	9,335,899	19,344,763	73.3	7,029,835	5,254,077	4,260,426	3,604,851	6,371,163
Pittsburg & Shawmut	Oct.	100	60,574	313	61,657	12,020	17,742	1,266	17,742	51,586	83.6	10,071	8,234	7,633	1,532	11,223
	10 mos.	103	427,579	3,085	437,969	108,111	160,426	12,182	146,321	457,092	104.3	—19,123	—32,776	—11,177	35,218	44,524
Pittsburgh & West Virginia	Oct.	138	336,955	.....	356,459	70,056	87,049	18,107	66,551	279,317	78.4	77,142	49,453	88,870	125,874	110,290
	10 mos.	138	3,007,597	.....	3,179,116	420,079	725,622	167,188	619,670	2,196,128	69.1	983,088	734,920	1,060,481	833,694	1,280,883
Pittsburg, Shawmut & Northern	Oct.	190	103,757	10	105,664	17,381	20,617	1,394	36,117	82,119	77.7	23,545	21,184	11,252	—4,781	13,815
	10 mos.	190	857,053	394	872,174	175,392	177,599	13,750	315,102	747,562	85.7	124,612	101,923	36,307	—8,702	63,019
Reading	Oct.	1,456	4,900,450	309,461	5,446,947	373,574	892,266	76,030	1,876,340	3,437,895	63.1	2,009,052	1,451,390	1,530,849	1,398,038	1,792,496
	10 mos.	1,456	43,281,336	3,244,978	48,611,357	3,542,017	8,319,105	746,447	18,299,912	33,183,373	68.3	15,427,984	11,142,357	11,564,180	9,953,410	14,209,191
Richmond, Fredericksburg & Potomac	Oct.	117	308,488	144,711	581,502	53,772	126,741	10,053	209,303	438,430	75.4	143,072	95,226	86,218	—11,186	112,473
	10 mos.	117	3,148,933	1,787,141	6,139,629	586,717	1,244,310	90,868	2,396,202	4,759,234	77.5	1,380,395	962,667	589,931	270,339	857,743
Rutland	Oct.	407	207,464	36,547	314,856	45,324	58,664	10,972	136,516	265,630	84.4	49,226	35,763	34,398	2,213	45,865
	10 mos.	407	1,942,021	324,705	2,865,210	453,975	549,746	106,601	1,388,137	2,642,173	92.2	223,037	92,369	89,812	—114,633	205,081
St. Louis-San Francisco	Oct.	4,928	4,052,980	311,176	4,738,259	642,999	979,450	117,215	1,581,741	3,468,450	73.2	1,269,809	949,453	1,000,801	524,700	1,267,112
	10 mos.	4,928	33,372,562	2,788,341	39,539,148	5,785,843	9,308,070	1,132,811	14,146,661	32,130,009	81.3	7,409,139	4,403,524	4,580,710	1,498,476	7,260,746

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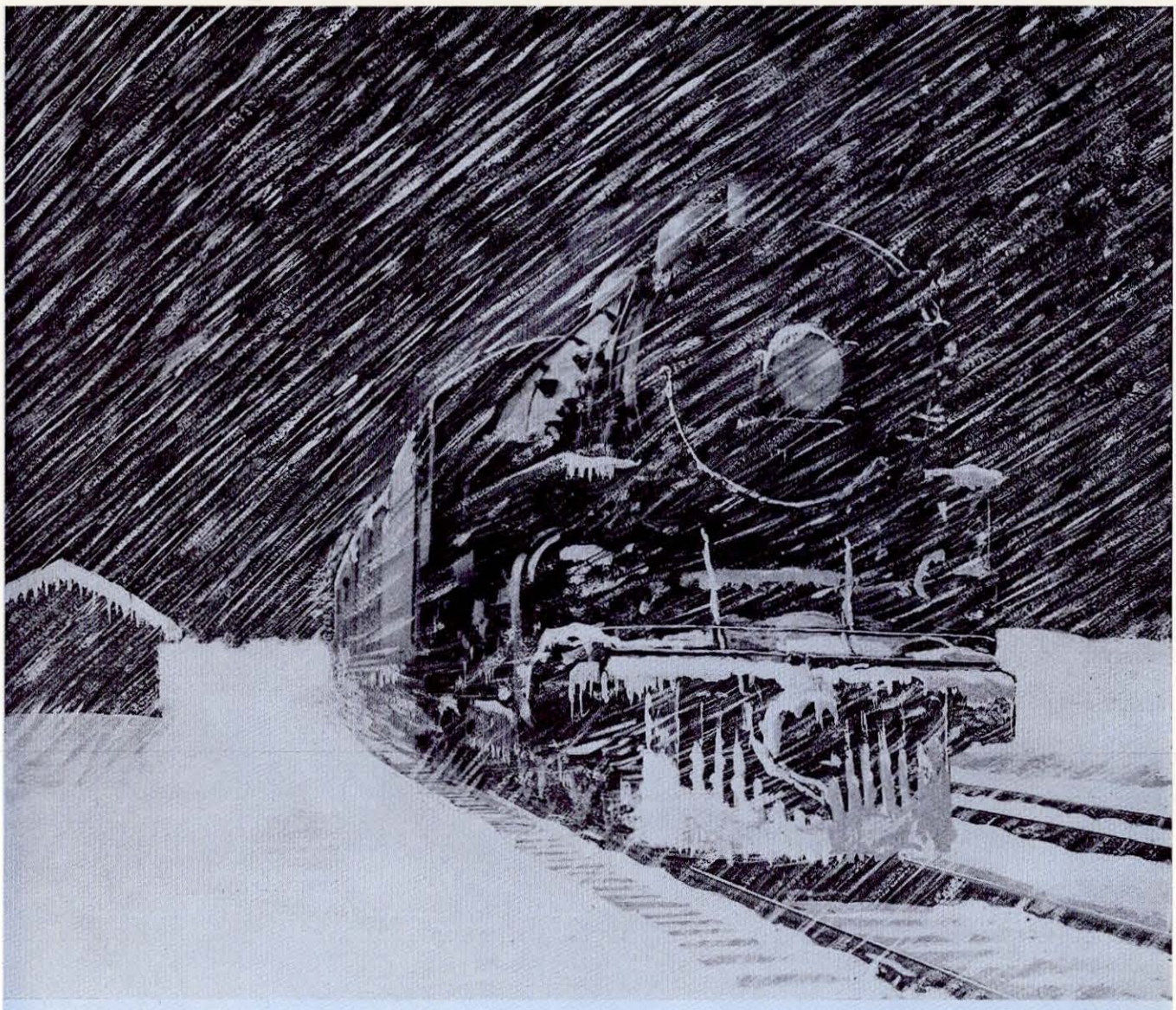


WINTER WEATHER WORRIES

Winter weather worries—pole lines down—communication lost—trains tied up. Avoid these troubles by the installation of "Union" Coded Track Circuits requiring no signal control wires. They provide increased safety as trains may be operated with continuous automatic block signal protection irrespective of weather conditions. Thus the operating officer's load is lightened when confronted with emergency conditions. Applicable in steam or electrified territory. Nearly 5,000,000 train miles annually have proved the safety, reliability and operating advantages of this system.

Write our nearest district office who will gladly furnish you detailed information. » » » » » » »

1173

1881 **Union Switch & Signal Co.** 1936

SWISSVALE, PA.

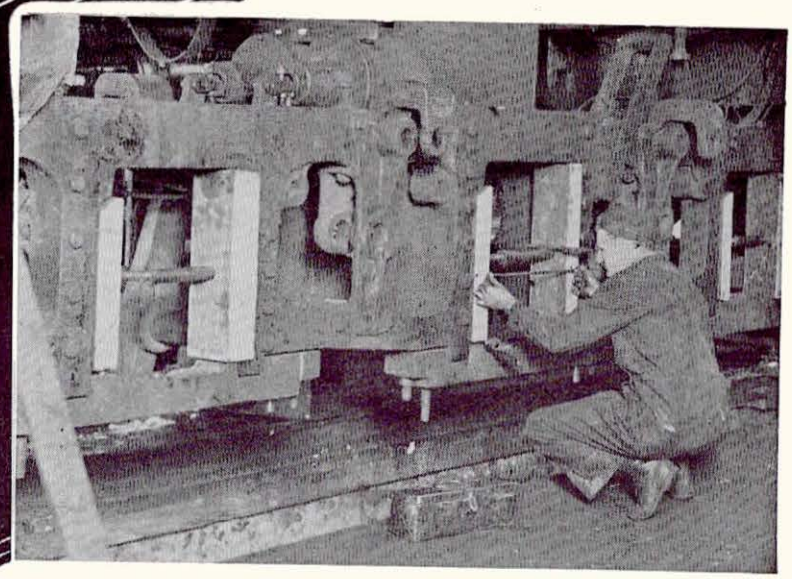
NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr.& retir. 1936	After depr.& retir. 1935	Before depr.& ret.
Fort Worth & Rio Grande	Oct.	233	$28,475	$394	$36,964	$12,052	$6,980	$2,022	$23,562	$46,942	127.0	—$9,978	—$14,152	—$17,135	—$10,184	—$17,084
	10 mos.	233	302,061	9,039	383,538	134,559	78,933	21,371	226,593	488,654	127.4	—105,116	—147,265	—212,680	—214,483	—212,172
St. Louis, San Francisco & Texas	Oct.	261	116,957	1,288	122,204	41,985	13,611	5,686	49,042	117,519	96.2	4,685	—2,479	—26,410	—31,788	—26,308
	10 mos.	261	1,071,201	8,365	1,118,299	384,449	139,478	56,233	474,232	1,122,379	100.4	—4,080	—66,518	—383,617	—386,235	—382,345
St. Louis Southwestern Lines	Oct.	1,749	1,718,329	37,243	1,835,580	281,472	283,983	76,798	495,705	1,217,314	66.3	618,266	515,100	401,784	312,898	452,104
	10 mos.	1,770	14,908,086	244,022	13,756,885	1,958,062	2,497,609	758,037	4,725,810	10,653,117	67.6	5,103,768	4,167,190	2,655,623	2,019,342	3,160,039
Seaboard Air Line	Oct.	4,307	2,669,118	282,909	3,313,614	517,570	661,511	159,726	1,179,165	2,686,816	81.1	626,798	526,798	452,160	67,190	609,892
	10 mos.	4,307	24,051,253	3,711,799	30,909,462	4,544,978	6,585,429	1,521,216	11,693,284	26,157,659	84.6	4,751,803	2,926,803	2,121,889	1,289,948	3,690,571
Southern Railway	Oct.	6,641	7,492,296	807,179	9,113,859	974,445	1,620,152	143,736	2,977,095	6,026,066	66.1	3,087,793	2,579,933	2,227,431	1,850,065	2,498,102
	10 mos.	6,641	64,130,577	8,045,063	78,957,438	9,473,506	14,388,872	1,482,192	27,371,559	55,733,682	70.6	23,223,756	18,568,323	15,627,082	10,948,411	18,333,600
Alabama Great Southern	Oct.	315	511,800	55,798	614,429	77,105	130,414	12,489	189,852	431,339	70.2	183,090	131,380	102,498	70,392	125,773
	10 mos.	315	4,495,174	510,183	5,398,296	859,213	1,166,313	115,916	1,678,864	4,019,010	74.5	1,379,286	979,143	756,773	313,278	989,307
Cinn., New Orleans & Texas Pacific	Oct.	336	1,299,786	86,863	1,472,941	177,836	296,678	28,415	326,577	879,314	59.7	593,627	500,293	484,333	432,079	533,522
	10 mos.	336	12,083,255	971,986	13,816,336	1,734,646	2,611,132	266,709	3,256,161	8,345,637	60.4	5,470,699	4,361,732	4,059,836	2,963,606	4,559,484
Georgia Southern & Florida	Oct.	397	134,662	25,959	181,624	35,713	46,989	1,630	73,129	163,308	89.9	18,316	5,586	2,454	3,431	9,494
	10 mos.	397	1,296,090	393,004	1,884,110	317,973	406,916	18,107	818,156	1,628,126	86.4	255,984	130,441	47,549	21,406	118,038
New Orleans & Northeastern	Oct.	204	230,578	19,843	269,038	32,720	37,835	5,305	75,224	161,968	60.2	107,070	82,537	60,057	32,745	66,138
	10 mos.	204	1,919,544	189,260	2,272,610	293,629	351,333	54,553	707,160	1,512,091	66.5	760,519	526,282	308,507	159,401	369,411
Northern Alabama	Oct.	100	67,423	2,034	71,479	19,815	1,324	980	19,087	43,183	60.4	28,296	23,972	10,229	—534	10,229
	10 mos.	100	543,846	18,906	581,763	116,390	13,976	11,428	175,915	335,505	57.7	246,258	206,410	83,598	10,817	84,299
Southern Pacific	Oct.	8,772	12,547,446	1,677,192	15,290,087	1,158,769	2,202,603	340,104	5,647,947	10,225,532	66.9	5,064,555	4,402,535	3,588,909	2,792,062	4,061,640
	10 mos.	8,772	97,805,861	17,284,432	124,568,062	11,783,986	20,546,664	3,136,340	46,299,358	89,994,056	72.2	34,574,006	26,312,406	19,861,957	13,901,380	24,633,226
Southern Pacific Steamship Lines	Oct.	....	588,864	21,772	630,596	21,405	105,603	18,979	385,934	550,818	87.4	79,778	80,259	80,008	—56,579	115,116
	10 mos.	....	4,535,571	212,461	4,924,619	195,414	943,821	169,994	3,437,725	4,936,022	100.2	—11,403	—49,540	—52,057	—487,529	301,247
Texas & New Orleans	Oct.	4,430	3,362,899	313,733	3,997,327	498,476	649,157	123,451	1,277,065	2,782,086	69.6	1,215,241	1,050,565	895,713	734,702	1,031,987
	10 mos.	4,430	27,960,037	2,846,308	33,478,186	4,703,355	6,497,137	1,215,047	11,419,358	26,106,885	78.0	7,371,301	5,171,243	3,474,200	1,687,214	4,864,133
Spokane, Portland & Seattle	Oct.	946	819,471	48,581	928,781	79,089	85,431	9,503	305,297	508,580	54.8	420,201	363,309	278,159	196,208	294,653
	10 mos.	946	5,900,388	482,267	6,899,822	921,388	808,885	92,635	2,415,087	4,525,038	65.6	2,374,784	1,689,153	1,100,410	1,254,483	1,265,393
Tennessee Central	Oct.	286	238,510	5,200	258,000	46,919	32,984	6,444	76,616	171,735	66.6	86,265	89,340	73,051	55,597	78,981
	10 mos.	286	1,906,712	53,477	2,076,839	358,163	291,570	57,661	673,640	1,475,607	71.1	601,232	525,063	391,860	356,986	451,565
Texas & Pacific	Oct.	1,948	2,152,440	303,866	2,724,822	278,301	535,950	84,035	762,786	1,804,273	66.2	920,549	737,481	621,460	625,654	718,365
	10 mos.	1,949	18,718,340	2,285,416	22,867,959	2,528,478	4,237,539	779,018	6,850,541	15,759,923	68.9	7,108,036	5,618,716	4,367,598	3,977,972	5,339,861
Texas Mexican	Oct.	162	88,896	999	99,112	19,591	16,324	3,517	37,802	84,326	85.1	14,786	8,396	4,183	4,801	6,026
	10 mos.	162	955,682	5,313	1,066,332	176,104	153,329	33,523	352,603	787,544	73.9	278,788	218,381	156,010	171,975	174,410
Toledo, Peoria & Western	Oct.	239	218,136	3	223,061	68,183	14,675	17,098	52,307	160,993	72.2	62,068	48,410	28,137	42,799	40,549
	10 mos.	239	1,975,742	67	2,005,066	570,761	134,363	167,960	477,177	1,445,380	72.1	559,686	435,400	252,136	156,192	370,578
Union Pacific System	Oct.	9,918	14,360,762	1,328,638	16,899,374	1,360,734	2,458,850	322,518	4,920,839	9,872,262	58.4	7,027,112	5,929,547	4,821,494	4,098,547	5,362,243
	10 mos.	9,854	103,105,903	12,612,071	126,103,982	14,755,104	24,147,276	3,208,406	40,434,013	90,655,336	71.9	35,448,646	24,581,915	17,800,473	14,594,287	23,187,542
Utah	Oct.	111	115,143	.....	115,359	2,178	23,883	418	25,589	56,240	48.8	59,119	48,275	46,908	61,052	56,738
	10 mos.	111	842,796	.....	845,377	138,047	218,450	4,446	202,407	607,556	71.9	237,821	154,323	152,427	93,835	250,675
Virginian	Oct.	619	1,708,420	3,595	1,771,161	131,217	274,591	20,125	256,411	712,017	40.2	1,059,144	934,144	1,016,492	905,004	1,110,475
	10 mos.	619	13,835,566	38,604	14,405,071	1,111,398	2,517,744	189,307	2,401,716	6,524,184	45.3	7,880,887	6,670,887	7,243,066	5,968,715	8,177,701
Wabash	Oct.	2,446	3,608,116	203,478	4,096,361	444,451	713,383	150,303	1,437,613	2,909,331	71.0	1,187,030	971,509	677,123	668,458	853,766
	10 mos.	2,447	33,157,560	2,044,339	37,922,982	4,585,953	6,924,733	1,433,621	14,115,053	28,645,438	75.5	9,277,544	7,255,872	4,358,908	3,809,475	6,134,121
Ann Arbor	Oct.	293	338,214	2,894	351,703	30,647	76,874	11,961	137,199	269,027	76.5	82,676	64,762	50,848	55,189	70,808
	10 mos.	293	3,100,305	34,434	3,260,546	295,934	746,909	120,067	1,369,198	2,658,239	81.5	602,307	429,295	310,728	426,211	511,340
Western Maryland	Oct.	882	1,488,552	9,841	1,532,876	215,914	260,420	37,347	341,886	908,405	59.3	624,471	514,471	537,371	364,890	629,566
	10 mos.	882	13,004,552	81,571	13,418,404	1,792,910	2,770,056	366,256	3,292,791	8,728,262	65.0	4,690,142	3,710,142	3,808,496	3,277,520	4,755,603
Western Pacific	Oct.	1,207	1,716,977	54,627	1,803,629	229,880	288,366	55,353	602,533	1,218,275	67.5	585,354	501,033	377,731	459,533	429,377
	10 mos.	1,207	11,471,087	385,187	12,173,522	2,812,171	2,401,570	566,370	4,702,533	10,909,365	89.6	1,264,157	454,561	—346,131	418,927	168,705
Wheeling & Lake Erie	Oct.	512	1,340,532	1,547	1,412,726	173,332	335,558	31,409	400,369	997,129	70.6	415,597	276,540	372,121	362,276	439,289
	10 mos.	512	11,960,588	18,562	12,709,096	1,759,726	2,982,988	306,101	3,700,098	9,088,981	71.5	3,620,115	2,331,196	2,770,753	1,966,915	3,600,811
Wichita Falls & Southern	Oct.	203	43,969	24	48,708	14,703	3,165	1,378	14,614	36,920	75.80	11,788	8,178	6,632	8,866	8,583
	10 mos.	203	412,397	915	470,578	95,856	56,263	15,691	141,754	340,822	72.43	129,756	97,671	76,009	78,225	95,528

Prevent Destructive Pounds



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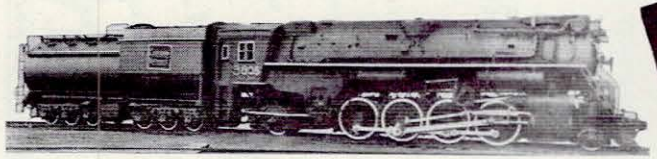
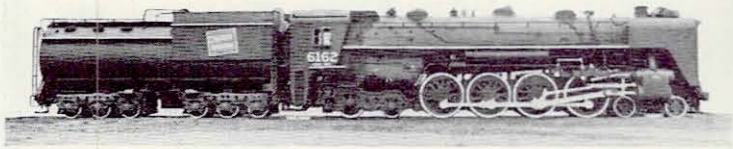


BARCO equipped Canadian National Locomotive 3805.



BARCO equipped Canadian National Locomotive 6162.

The locomotives shown here were built this year for Canadian Railroads. They are equipped with BARCO power reverse gears, BARCO Metallic Connections between locomotive and tender, BARCO Joints in locomotive piping, and BARCO rear of tender connections. Such recognition is proof that the use of BARCO equipment by leading railroads depends on value and service. BARCO is first choice because of safe, reliable performance at lower cost.

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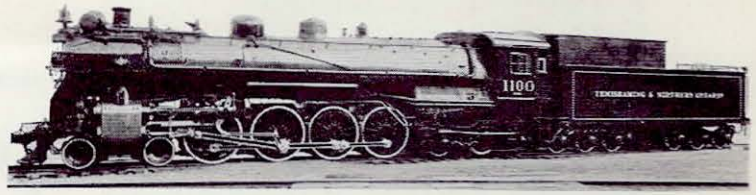
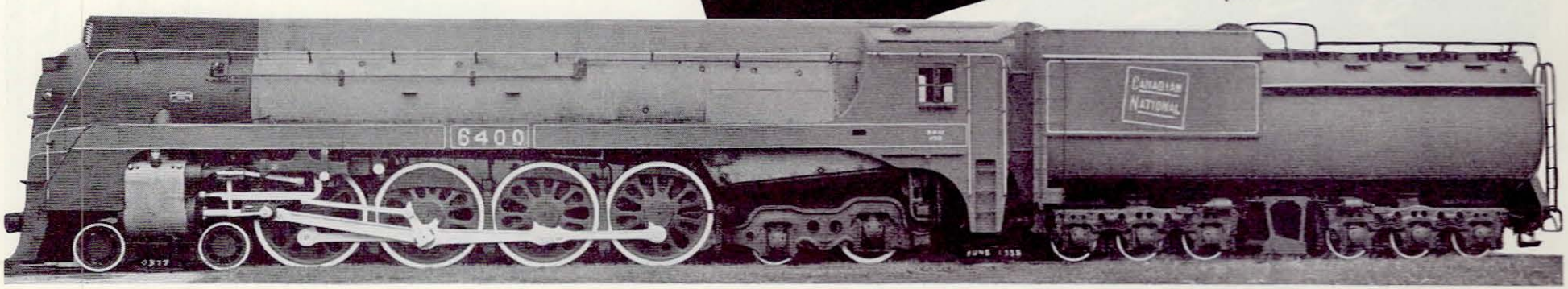


BARCO equipped Temiskaning and Northern Locomotive 1100.

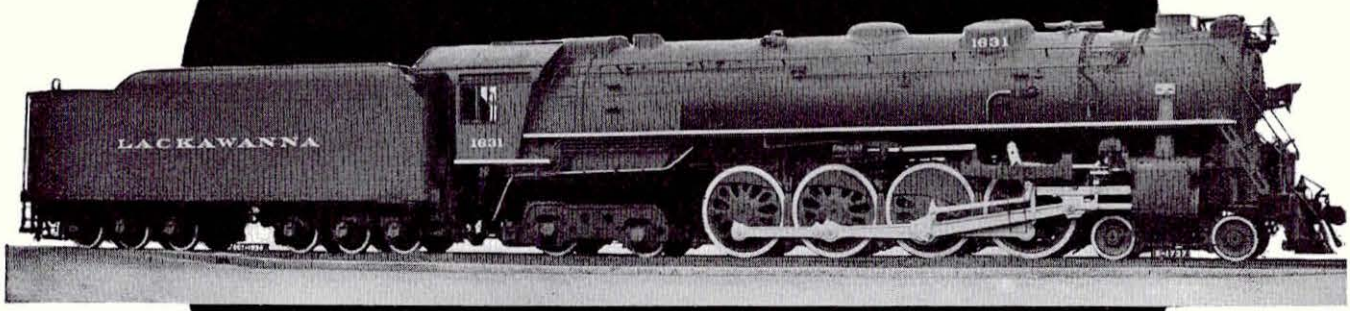
BARCO equipped Canadian Pacific Locomotive 3001.

BARCO equipped Canadian National Locomotive 6400.



Lackawanna Railroad

FIREBAR



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FIREBAR DIVISION
OF THE
WAUGH EQUIPMENT COMPANY
NEW YORK CHICAGO ST. LOUIS

CANADIAN WAUGH EQUIPMENT CO. LTD. MONTREAL

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Train Dispatching Equipment (Continued) — Balanced Armature Type Magnetic Loud Speaker combines clear reproduction with compact size—handy mounting.

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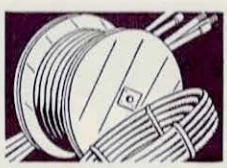

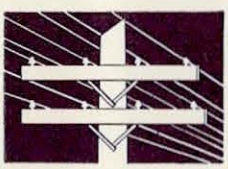

4

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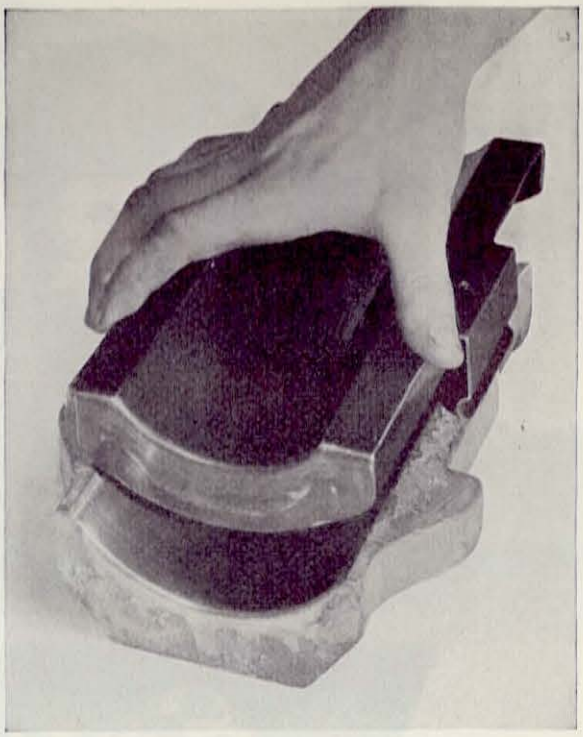

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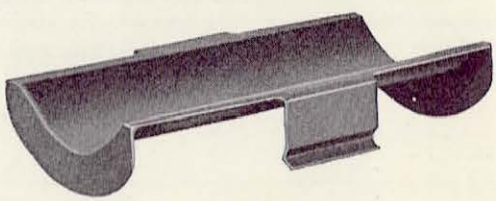
Macer Journal Bearing Protectors will eliminate for your road, as they are doing for many others, EVERY HOT BOX CAUSED BY DAMAGED BEARING LININGS. Think of the saving in operating expense every time you prevent a hot box—it is pure gain. . . Send for full information.

★*Records of a large middle west railroad showed that every hot box averaged $50 in direct expense—exclusive of claims.*



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PATENT NO. 2,041,744

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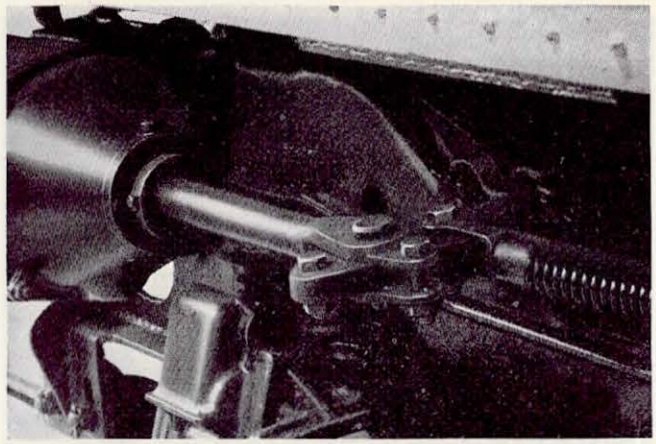

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Dardelet considers it a real break to get this important application on one of the largest, busiest and fastest rapid transit lines in the world. It shows that their experience with Dardelet Threadlock Bolts in hundreds of places over considerable time has been satisfactory. It proves their confidence in Dardelet. The threads on a Dardelet Bolt are self-locking. No other locking device is required . . . no lock washer nor castellated nuts with cotter pins. They therefore require fewer stock items, are simpler to apply and quicker to check. You can save money and increase safety by using Dardelet.

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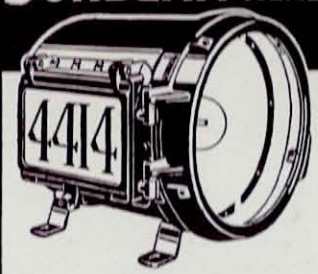

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ROYAL STATE RAILWAYS OF SIAM

NOTICE

Sealed Tenders for the supply of Eight (8) Mikado Locomotives will be received by the Superintendent of Stores, Royal State Railways of Siam, Bangkok, Siam, until 14 o'clock on April 28, 1937.

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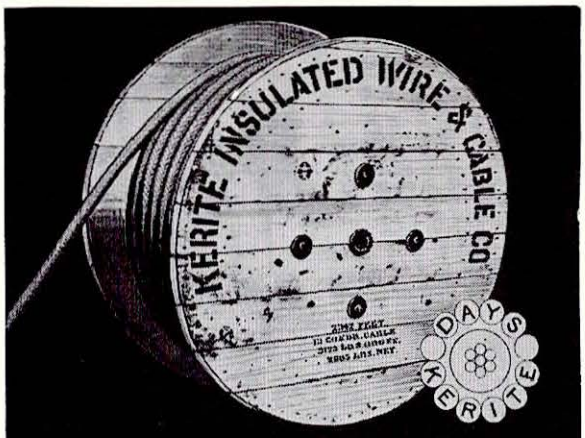

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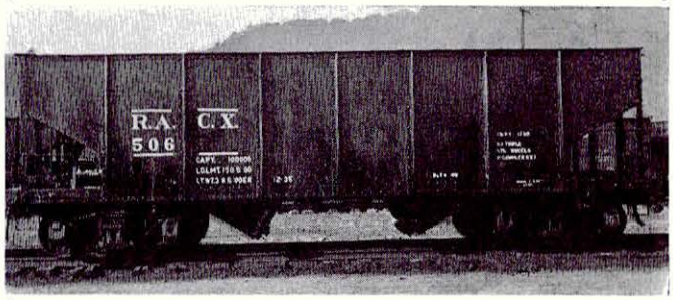

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TAKES CARE OF IT

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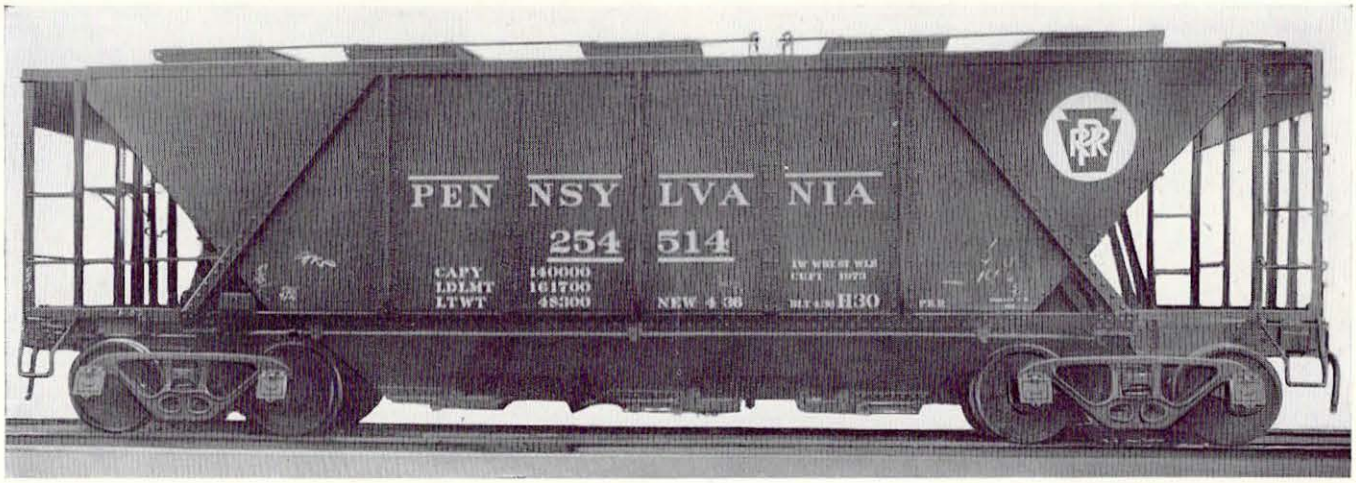

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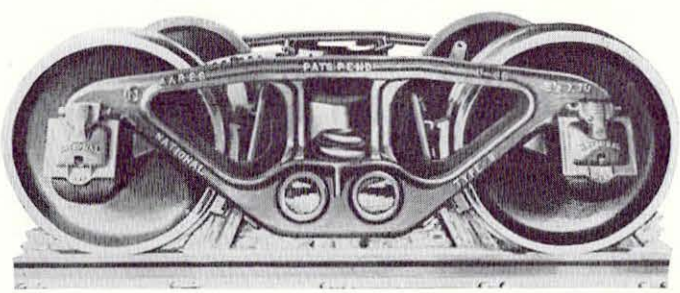

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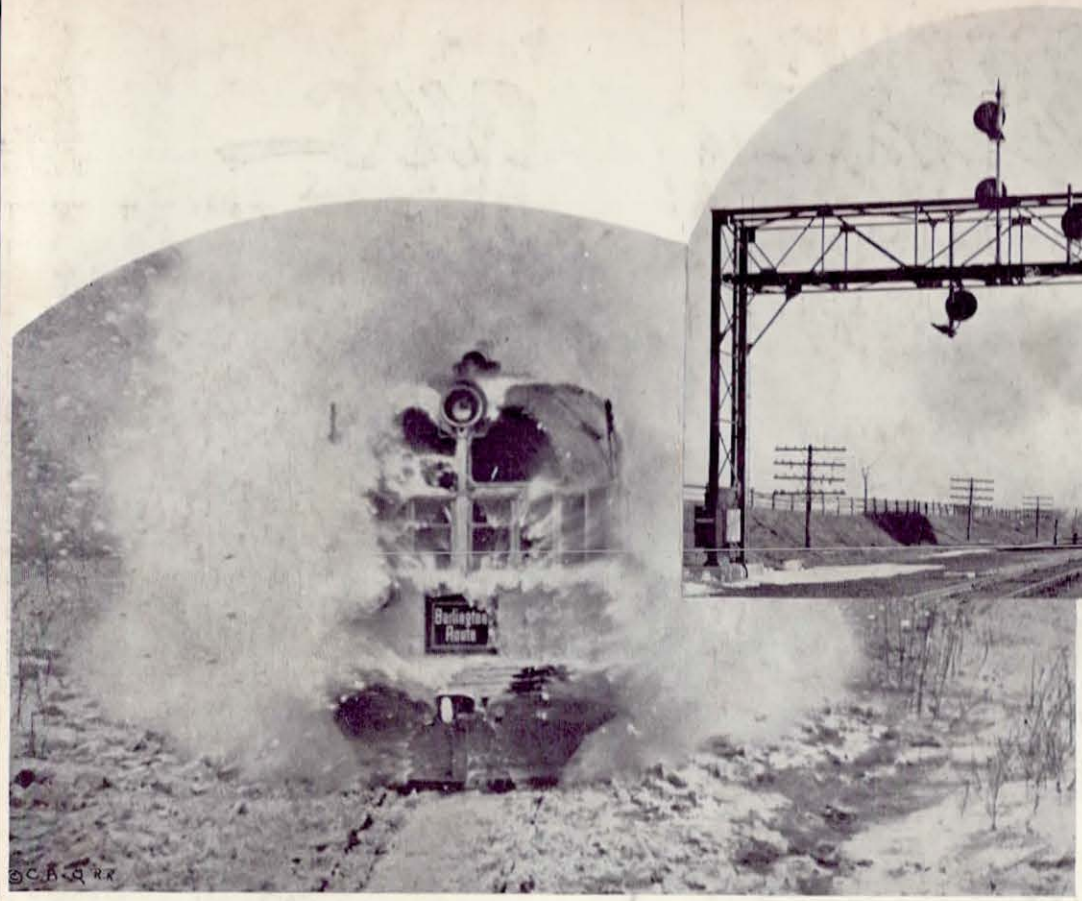

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